Business Leaders' Perspectives on the Role of Education and the Skillset Required in United Arab Emirates' Knowledge Economy

منظور قادة الأعمال حول دور التعليم في دولة الإمارات العربية المتحدة
في تكوين
مجموعة المهارات المطلوبة للتحول نحو اقتصاد المعرفة

by

HANNA BUCHLER-EDEN

A thesis submitted in fulfilment

of the requirements for the degree of

DOCTOR OF PHILOSOPHY IN EDUCATION

at

The British University in Dubai

August 2019

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Thesis Supervisor
Dr Solomon Arulraj David

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Abstract in English

The United Arab Emirates (UAE) is traditionally known for its vast oil reserves and associated wealth, however the Government has accentuated the necessity to transform into a knowledge economy. In order to do so it has reformed its education system with the objective of developing the requisite skills required in a knowledge economy during the formal education period. The purpose of this research is to obtain in-depth understanding of whether senior business leaders of large and medium companies operating in the UAE considered education to be a means of developing a knowledge economy skill set, and if education was important, how successful had it been in enhancing the availability of those skills in the UAE labour market. The initial stage of the thesis was to identify the components of the conceptual framework to answer the research questions, and to assess the progress that the UAE had made towards knowledge economy status, based on established studies and global institutional reports. Mixed methodology was employed to answer the research questions and accomplished by conducting semi-structured interviews with 15 UAE based business leaders, plus a quantitative survey answered by 138 multi-level managers and professionals employed in UAE. The qualitative data was analysed using content analysis, and the survey, was analysed by means of SPSS software. The major findings are that the skills needed for the UAE knowledge economy differed somewhat in ranking from those suggested by previous studies and that the current educational policies, although progress have been made, are not generating sufficient skills to meet labour market demands. The key limitations of the study included a lack of agreed definition of the knowledge economy and the challenge of acquiring robust data from local UAE sources. Several recommendations are made for further study including extending the education framework to embrace early childhood education and university research culture. Furthermore, the organization of a platform for business leaders and education leaders, researchers, policymakers and practitioners to share knowledge and practice, so that the output of skills levels from the education sector could be substantially enhanced.

ملخص البحث

تشتهر دولة الإمارات العربية المتحدة تقليديًا باحتياطاتها النفطية الهائلة والثروات المرتبطة بها، إلا أن الحكومة أكدت ضرورة التحول إلى اقتصاد المعرفة. ومن أجل القيام بذلك، قامت بإصلاح نظامها التعليمي بهدف تطوير المهارات المطلوبة في اقتصاد المعرفة أثناء فترة التعليم الرسمي. إن الغرض من هذا البحث هو الحصول على فهم متعمق بشأن إذا ما كان كبار رجال الأعمال في الشركات الكبيرة والمتوسطة العاملة في دولة الإمارات العربية المتحدة يعتبرون التعليم وسيلة لتطوير مجموعة مهارات اقتصاد المعرفة. وإذا ما كان التعليم مهمًا، فما مدى نجاحه في تعزيز توافر هذه المهارات في سوق العمل في دولة الإمارات العربية المتحدة. كانت المرحلة الأولى من الأطروحة هي تحديد مكونات الإطار المفاهيمي للإجابة على أسئلة البحث، وتقييم التقدم الذي أحرزته دولة الإمارات العربية المتحدة نحو وضعية اقتصاد المعرفة فيها بناءً على دراسات مقررة وتقارير مؤسسية عالمية. لقد تم استخدام منهجية مختلطة للإجابة على أسئلة البحث والتي أُنجزت من خلال إجراء مقابلات شبه منظمة مع 15 من قادة الأعمال في دولة الإمارات العربية المتحدة، بالإضافة إلى إجراء دراسة استقصائية كمية أجاب عليها 138 من المديرين متعددي المستويات والمهنيين المحترفين العاملين في دولة الإمارات العربية المتحدة. وتم تحليل البيانات النوعية باستخدام منهج تحليل المحتوى، و تحليل الدراسة الاستقصائية باستخدام برنامج الحزمة الإحصائية للعلوم الاجتماعية (SPSS). وتمثلت النتائج الرئيسة في أن المهارات اللازمة لاقتصاد المعرفة في دولة الإمارات العربية المتحدة تختلف نوعاً ما في الترتيب عن تلك التي اقترحتها الدراسات السابقة، وأن السياسات التعليمية الحالية، على الرغم من التقدم الذي أحرزته، لا تولد مهارات كافية لتلبية متطلبات سوق العمل. وشملت القيود الرئيسة للدراسة عدم وجود تعريف متفق عليه لاقتصاد المعرفة والتحدي المتمثل في الحصول على بيانات موثقة من مصادر محلية في دولة الإمارات العربية المتحدة. وتم تقديم العديد من التوصيات لمزيد من الدراسة بما في

ذلك توسيع إطار التعليم ليشمل ثقافة الطفولة المبكرة وثقافة الأبحاث الجامعية. علاوة على ذلك، ضرورة إنشاء منصة مشتركة لقادة الأعمال وقادة التعليم والباحثين وواضعي السياسات والممارسين تهدف إلى تبادل المعارف والممارسات، مما سيمكن من تحسين مخرجات مستوى المهارات في قطاع التعليم بشكل كبير.

Dedication

To Nils, your smart questions, critical thinking and passion are my source of motivation.

To Alexander, for showing me the true meaning of perseverance and looking at the bright side of life.

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List of Abbreviations

Full Phrase	Acronym
Abu Dhabi Centre for Technical and Vocational Education and Training	ACTVET
Abu Dhabi Department of Education and Knowledge	ADEK
British Association for Early Childhood Education	BAECE
Common European Framework of Reference	CEFR
Chief Executive Officer	CEO
Chief Financial Officer	CFO
Critical Success Factor	CSF
Dubai International Academic City	DIAC
Information and Communication Technology	ICT
Internet OF Services	IoS
Internet of Things	IoT
International Labour Organisation	ILO
Gross Domestic Product	GDP
Human Resource	HR
Key Performance Indicators	KPI
Knowledge and Human Development Authority	KHDA
New School Model	NSM
Organisation for Economic Cooperation and Development	OECD
The Quantity Assurance Agency for Education	QAA
Private Schools and Quality Assurance	PSQA
Raffles World Academy	RWA

United Arab Emirates	UAE
United Kingdom	UK
United Nations Educational, Scientific and Cultural Organisation	UNESCO
United Nations Human Development Index	UNHDI
United States	US
World Economic Forum	WEF

CHAPTER ONE: INTRODUCTION

1.1 Chapter Overview

This Chapter introduces research, which focuses on the challenges that the United Arab Emirates (UAE) must resolve, in order to transform from an oil based to a knowledge economy, primarily by looking at the role of education and the needed set of skills in the transition to and in the future knowledge economy.

The background and motivation for the study are first discussed and then the problem statement is developed from the social, educational and research context with an overview of the meaning of the knowledge economy and the reasons for its accomplishment being considered to be of vital importance to growth in the global economy, and in national economies, such as the UAE; the local and global rationales having similar and diverse features. In both the local and global context, individuals participating in the labour market must possess the requisite skills that have been identified as generating a knowledge-based economy, and these skills must be constantly developed as the vital technologies change underpinning its change (World Bank 2003). Development of the specific skills must be initiated and constantly strengthened and deepened by means of suitable educational programmes, which should be determined by the major stakeholders in this economic achievement, government, business leaders, and learning and development experts at all levels of individual and group learning and development programmes (Warhurst 2006). Involving all stakeholders increases the chance that the skills, knowledge and behaviours will meet current and future requirements of the UAE competing in the complex global business environment. However, the role of education is also important for the social and economic return on investment, to which the UAE has committed; accomplishing this goal is challenging from a number of perspectives, not least the current emphasis on western influenced educational programmes and the transformational change that must occur in the UAE. The research objectives and the research questions are presented in the next two sections, followed by hypotheses that must be proven disproven in section 1.6. The objectives, the research questions and the hypotheses all derive from problem statement, although the research questions and the hypotheses are refined, as necessary once the Literature Review is completed

(Saunders, Lewis & Thornhill 2015). The remainder of the Chapter discusses the relevance and importance of this research to business and educational knowledge generally, and to UAE's context in particular. The Chapter concludes with an overview of the dissertation structure.

1.2 Background and Motivation for the Study

Historically, substantial changes in technology have disrupted the traditional markets, reduced the quantity of labour required to produce a good or service, and traditional skill have become obsolescent; individual workers lose their jobs owing to this phenomenon referred to as creative destruction (Schumpeter 1974; Christensen 1997). A study conducted by Cox and Alm (1992) demonstrated this concept by identifying US jobs categories that employed substantial numbers one hundred years ago, for instance blacksmiths, boilermakers and watchmakers that do not exist now, and highlighting new occupations, for instance lorry, bus and taxi drivers and computer operators and programmers in very large numbers. Creative destruction is demonstrated by the relatively fast disappearance of mainframe computers as personal computers became the standard workplace access to data and transmission and fixed telephone lines becoming obsolete as mobile phone technology developed (Cox & Alm 1992) and continues to do so, leading to obsolescence of 3G, 4G and 5G technologies (Fleck 2018). The technological advances generate economic growth and social change, economic development is continuous and results in the closure of some traditional aspects of life as new ones emerge and simultaneously alters social structures, for instance local business, employment patterns, population and equalities (Summers & Branch 1984). However, economic growth cannot be obtained from these technologies without the relevant education of individuals to improve the quality of labour in the labour market by teaching them better working habits, discipline and reliability, suitable skills and understanding of workplace requirements, how to work more efficiently and to quickly adapt to change and provide them with greater capacity to change employment to more productive occupations as they become available (Machlup, 1969, pp. 393-394). The inference is that education must instil new behaviours, knowledge and skills so that new technologies can be exploited to drive economic and social improvement and vice versa.

Advances in technology, which have also generated rapid globalisation exemplified by transformation of transport infrastructure and communication (Kotter 2012), have forced global economic modification from an industry base to a knowledge base, requiring new skills, knowledge and attitudes (Mahdi, Almsafir & Yao 2011).

The UAE is a constitutional federation comprising seven states: Abu Dhabi, Ajman, Fujairah, Sharjah, Dubai, Umm al Quwain and Ras al Khaimah; Abu Dhabi is the capital city (CIA 2018; GOVae 2018a). The native language is Arabic, although many other western, and far eastern languages are commonly spoken; the official religion is Islam. Whilst the native population in 2010 was 947,999, with approximately 10,000 more males than females, the total UAE population was estimated at 9,121,167 in 2016 and composed of 69% males 31% females and over 200 nationalities (GOVae 2018a). These demographics are of significant importance to this research because they impact on perceptions of appropriate education and labour force skills and knowledge. The type of Government is also significant because it is a federation and the political systems is based on the Constitution, which directs the political and constitutional structure, because it states the Federation's purpose and objectives. In the last two decades significant governmental reform has taken place to enable greater focus on socio-economic issues that would allow the UAE to be better prepared to resolve challenges driven by increasing globalisation. A major political intervention was the creation of Vision 2021 and GOVae (2018b, p.1) stated that: "UAE nationals have ambition and sense of responsibility, are capable of drawing the future with confidence and participate effectively in a sustainable socio-economic environment based on stability, solidarity, moderate Islamic values and national heritage".

Vision 2021 also specified its overall goals as being to protect UAE by means of all states sharing the goal of balanced development, and of creating a diverse, flexible economy led by skilled native Emiratis, which was based on knowledge (GOVae 2018b). The UAE legal system comprises Islamic law and civil law.

The UAE is in the process of diversifying its economy from its traditional reliance on oil and gas to a competitive knowledge-based economy, which is a major strategic goal in its 2021 vision (Executive Council 2007). Whilst the UAE has made

significant progress in reducing its dependence on oil, reliance is still high since its contribution to the economy remains at 30% (Nagraj 2015).

Historically, the UAE has experienced high rates of Gross Domestic Product (GDP), consistent with those of Western European countries but, during and after the 2008 global financial crisis, the average annual GDP rebounded in 2010 (IMF 2019). The recent decline in oil revenues has forced the Government to reduce its expenditure, especially on social programmes, and introduced fuel tax and other taxes for the first time in 2015 and continues to do so and 5% VAT in 2017 (Saadi 2017). The impact of the global financial crisis on the world's largest economy meant that oil prices fell as did property prices, and reduced oil income, investment in property and new construction in the UAE such that, from 2012 onwards, the Government stated that economic growth based on oil was no longer sustainable (IMF 2017; CIA 2017). Also, already the founding father of the UAE, Sheikh Zayed bin Sultan Al Nahyan, highlighted the importance of human assets and their education for a nation.

Future economic growth will be generated by knowledge, innovation and productivity, such that the UAE competes with the most successful global economies. In order to accomplish this challenging objective, knowledge must be substantially enhanced, meaning that education and the institutions that provide it must integrate the major complementary factors of technology, entrepreneurial skills, problem solving and an appropriate environment for collaborative learning (Schiliro 2013). The importance of education is its capacity to increase human capital in the region (Schiliro 2013) and still be an important part of socialisation (Cuban 2013) and set the foundation for values and behaviours (Türkkahraman 2014) and therefore the education system devised must be capable of changing existing mindsets towards change (Cuban 2013; Machlup 1969), whilst still maintaining the culture (Ali 1996).

The educational system developed must be underpinned by appropriate learning skills and motivate citizens to undertake higher education in specialisms that drive development and application of new technologies, specifically science and engineering. Education must also be linked to creating a highly skilled and knowledgeable labour force (Schiliro 2013; Executive Council 2007; IMF 2017) but some non-routine manual tasks remain (Levy & Murnane 2013), which do not require

higher education but cannot be programmed into a computer, because as they require optical recognition and fine muscle control.

Education spending in UAE amounts to 1.6% GDP, which appears much lower than the 4.5% GDP that the Organisation for Economic Co-operation and Development (OECD) recommends, because the figure 1.6% of GDP is misleading. This apparent mismatch occurs because only 20% of the population receives public education, the remaining 80% being privately educated, compared to 31% in OECD countries. Hence, Government spending on public education is higher than in northern European countries, for instance Finland and Denmark, and equates to more than $US22,000 per pupil (IMF 2017). However, the structure of education in the UAE represents a potential issue, such that the UAE Government recognises the need to regulate the learning of students at all levels to accomplish its knowledge economy goal (WAM 2010).

The researcher has several personal and professional reasons for undertaking this doctorate thesis, fundamentally it is an extension of a master's thesis, which concerned the implementation of the New School Model (NSM) in the Emirate of Abu Dhabi from a teacher perspective. During this time the researcher noticed that teachers do not feel involved in the implementation of the new policies and students are confused. As the researcher collaborated with education consultancy firms delivering and implementing imported education models in the UAE further challenges in implementation as well as a research gap in this field were noted. The researcher grew up, studied and worked in Finland and gained international experience across various business and education environments. In particular the researcher lived through policy changes in Finland which transformed the country to one of the top-rated countries in education. Although this policy was solely aimed at a Finnish context, still 'best practice' from this success was "prescribed to others' (Novoa 2018). Additionally, the researcher witnessed two economic downturns in the UAE and the coinciding UAE Government's vision of transforming into a leading knowledge economy. However, during the course of these events it became evident to the researcher that Business and Educational Leaders had diverse perceptions of the role of education in transforming the UAE to a knowledge economy, further generating the researcher's interest in identifying the mismatch and providing

guidelines for a different approach to educational policy and practice that would remove it. This is important to the UAE accomplishing its goal to be world leading knowledge economy within a relatively short period. The motivation of the study was made transparent as it might help to put the research in context as the qualitative researcher makes sense of the philosophical influences in a personal way (Merriam 2009). Still in order to avoid bias, the researcher has attempted to take an objective approach and furthermore mixed research was undertaken as bias is less likely in quantitative research (Winter 2007).

1.3 Problem Statement

The world's current business environment is the result of the evolution of technology, and characterised by four industrial revolutions; the third being referred to as the knowledge economy and the fourth as Industry 4.0, which is based on digital technologies and enhances the position of knowledge as the driver of competitive advantage. Economic progress is driven by innovation, by introducing new ideas that produce goods or services in a completely new manner, simultaneously making previous knowledge and skills, manufacturing and administrative processes, redundant (Gabriel & Pessl 2016).

The first industrial revolution occurred towards the end of the 18th century with the invention of mechanical tools that enabled faster production and much higher outputs than the artisanal methods employed previously (Schwab 2016). By the end of the 19th century, electricity had been invented, which allowed mass production and the division of labour resulting in job specialisation (Gabriel & Pessl 2016). Electronics were the basis of the third industrial revolution in the 1970s, when automated processes became possible (Schwab 2016), the first personal computer and development of the internet all belonged to this era. Computers could process data; they could store it and retrieve and employ the information (Gabriel & Pessl 2016) and replace or improve human cognition related to tasks that could not previously be mechanised. The consequence was that many job roles, which required working with repetitive information, have decline over the last four decades (Pozdnuakova, Golikov, Peters & Morozova 2019).

The fourth industrial revolution referred to as Industry 4.0 is characterised by communication between machines, between machines and people and between

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people; sensors embedded in machines allow data to be passed so that processes can be totally automated with minimum human intervention. Virtual and physical processes are combined, with the human effort predominantly related to control (Gabriel & Pessl, 2016; Roblek, Mesko & Krapez 2016). Industry 4.0 is further described as comprising several digital technologies, cyber physical systems, the Internet of Things (IoT) and the Internet of Services (IoS); uninterrupted communication supported by the internet (Roblek, Mesko & Krapez 2016). This communication phenomenon infers that Knowledge Management (KM) 4.0 is required, for instance, because the IoT will lead to huge amounts of data, Big Data, transferred from objects and stored in Cloud, and the data being accessible in real time, enabling communication between objects, between people and between people and objects (Domenici, Roblek, Abbate & Tani 2016).

In a complementary description of industrial evolution, the 20th century is referred to as the manufacturing or industrial age, and the 21st century as the information or knowledge age, the two terms being used interchangeably (Stehr 2010). The features of the manufacturing age include standardised goods with little product variation, which was controlled by quality systems; a tangible product; centralised decision making; a hierarchical organisational structure human capital becoming more valued over time, and local decision making emerging. Key employees operated machines, and semi-skilled or skilled workers were preferred and provided with defined job roles and responsibilities, so that work was controllable and predictable, workers were comparable to machines, according to Shek, Chung and Leung (2015).

The terms knowledge or information age are often used to express the same concept, and the two concepts overlap because they demonstrate how knowledge has become the means to economic growth and competitive advantage (Stehr 2010). However, the link between them is also often articulated as, for instance, information being expressed as knowledge, which has been communicated in the form of shorter messages. However, several other ideas of the connection between knowledge and information exist, including information being the raw material from which knowledge is created; codified knowledge; indirect knowledge; cumulative collection of information (Stehr 2010). Additionally, knowledge has been categorised into explicit and tacit knowledge. Explicit knowledge is associated with the written

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account and tacit knowledge or know-how to the possession specific skills that a master craftsman might possess but find difficult to externalise, since they have been acquired over a long period of time (Smith 2001). Tacit knowledge is important for individuals to make effective use of new technologies (Handoko, Nursanti, Harmanto & Suriano 2016). The task of converting tacit knowledge into explicit or codified knowledge is challenging because the possessor of tacit knowledge, cannot fully express it (Smith 2001; Handoko et al. 2016), but interaction by various means between possessor and learner can enable transfer of knowledge, referred to as the concept of 'ba' by Nonaka and Konno (1998).

The difficulty that an individual experience in externalizing tactic knowledge is because s/he employs heuristics, in other words, identifies the problem and the elements of an appropriate solution (Polanyi 1966). Heuristics are described as a rule or method by Feigenbaum and Feldman (1963), a strategy, simplification or other tactic that delivers an acceptable solution to an issue in a relatively short time. The explanation offered by Romanycia and Pelletier (1985) is that heuristics enable individuals to make intelligent guesses because they have previous knowledge of similar issues and use it to make sense of a comparable problem by an analogous thinking and acting process. The use of heuristic strategies in teaching methodologies are therefore important to developing the problem-solving skills (Lucas 1974) that young people require to actively and productively participate in the knowledge economy.

The characteristics of knowledge work and knowledge workers are ill defined, and a review of 64 American and Chinese literature by Zhan, Tang and Zhang (2013) found 35 characteristics, of which those cited in more than 10 articles were independence, creativity, realisation of self-value, knowledge was equivalent to capital, individualist, loyal to occupations rather than employers and, therefore, individuals did not accept leadership authority. Hence work processes were difficult to supervise, outcomes difficult to measure, and employee turnover rate was high. This could develop to a GIG economy with temporary and flexible jobs conducted from independent contractors and freelancers instead of full-time employees who rarely change positions.

Therefore, the transformation from the industrial to the information age can be considered as an emerging global phenomenon, characterised by changes impacting on society with a similar magnitude to that experienced in the first Industrial Revolution during the 18th century, as society transformed from agriculture to manufacturing. The contrast between the work environment, employee skills and knowledge and the organisation of work, is substantial and highly challenging for employers, from a quality control and an employee retention perspective, for example. The overview of the two eras, manufacturing or industrial to knowledge and digital, emphasises the issue and the complexity of the concept of information and knowledge, including knowledge transfer.

The inference of this huge change is that this thesis has inherent value because its intention is to investigate the role of education and needed skills set to prepare young people for the new work environment, a complex problem that involves many human chains (Cuban 2013). This is reinforced by Baker (2013) who describes the education system in the industrial age as being a universal approach, in other words a similar curriculum for all. Hence school leavers would have been prepared for manufacturing work by being able to read and write effectively, and to have a good knowledge of arithmetic and other subjects (Baker 2013; Schoning & Whitcomb 2017). Passing examinations that relied on recalling facts or identifying the correct option in a series of multiple-choice questions, indicated ability and attitude. The additional skills needed to adapt to the work situation were provided by the employer's training initiative and continuous learning was not a priority.

The rapid technological changes occurring in 21st century mean that many facts taught in schools are no longer relevant and learning is continuous, and that employees must constantly learn and apply new skills (World Bank 2003). However, the current education system, in the United States for instance, continues to rely on standardised tests, which Baker (2013) emphasises as unsuitable for the current workplace and economic growth. In contrast, Finland attains high scores in the International Student Assessment (PISA), despite not having standardised tests. The current shortage of graduates required for the knowledge economy, for example those with science, technology, engineering and mathematics specialisation reinforces the misalignment

between education focus and business requirements. The decline in creative thinking from its dominance in early childhood with 98% children showing the skills to 3% of individuals by the age of 15 years, indicates the effect of the formal education system. The description of brain development by FTF (2019) highlights the facts that the human brain reaches 80 % of its adult size at 3 years of age and 90% by 5 years of age, and that behaviour is established in early childhood, and much more difficult to change in later life (FTF 2019). The implication is that early childhood education is crucial to fostering values and behaviours, as emphasised by Samuelson and Kaga (2007). Creativity is just one of the attributes required for knowledge working, and Schoning and Witcomb (2017) demonstrate that the skills set is constantly changing by comparing the key skills required in 2015 to those forecast as vital in 2025, table 1.

Figure 1: Rate of Return on Human Capital Investment in ECD
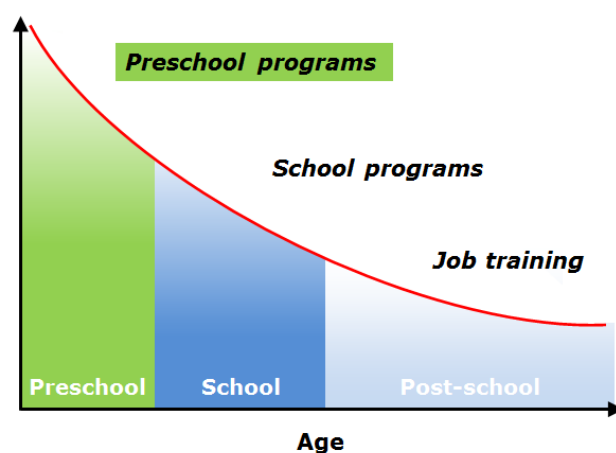
Source: Heckman and Masterov (2007, p.89)

Therefore, children growing in supportive, stimulating environments in early childhood are more likely to achieve better health outcomes and less likely to develop anti-social behaviour. The report by United Nations Educational, Scientific and Cultural Organization (UNESCO) (2014) proposes that Early Childhood Education can promote tolerance, encourage dialogue, develop important cultural and social values, and create a more sustainable, peaceful world. Gaining access to early childhood quality education that allows individuals to participate in society, relates to focusing on the cognitive and affective goals that provide the means to becoming a citizen who is healthy, physically and mentally secure and economically productive and socially active in society (SEN 2009). However, a study by Karaman (2011)

found that only 5% of Emirati children attended nurseries in Dubai and that public sector nursery provision was extremely low comprising two nurseries with 43 Emirati children enrolled.

Schools are an embedded part of the culture and the culture and social context is changing rapidly in the cross-cultural UAE. The schools are importing education models that are made by and for different contexts. PISA results should be analysed with caution as these tests are made for and by mono-cultural countries as well. As the workplace is changing rapidly and schools should change with it, this study will investigate the perspective of business leaders in the UAE. Peters (2003) explain the importance of government, education sector and businesses working together in a knowledge economy. Government have provided the education sector with policies, still the business perspective is a gap in research. The focus will be on business leaders with many years of experience as they have a 'parallel thinking' (Jaques 1986) and can see the big picture. Furthermore there is a research gap in the UAE regarding the same so the problem statement for this thesis is how to reconcile UAE educational policies and practices with the conflicting issues of: UAE Government goals to transform to a knowledge economy; the associated labour market demands; ill-defined skill set for accomplishing the knowledge economy; high proportion of migrant knowledge workers; low proportion of locals whom are leading the change; appropriate development of the behaviours and values of young people from early childhood; integration of cultural expectations; the perspectives of various stakeholders specifically business leaders.

Table 1: Changing Skills Set Requirements

	2020	2015
1	Complex problem solving	Complex problem solving
2	Critical thinking	Coordinating with others
3	Creativity	People management
4	People management	Critical thinking
5	Coordinating with others	Negotiation
6	Emotional intelligence	Quality control
7	Judgement and decision making	Service orientation
8	Service orientation	Judgement and decision making
9	Negotiation	Active listening
10	Cognitive Flexibility	Creativity

Source: Schoning and Witcomb (2017, p.1)

The economic changes also drive social change, in this case, employment and work tasks being particularly important (Gratton 2011; Malone, Laubacher & Johns 2011; Levy & Murnane 2013). The origin of the information age is attributed to Claude Shannon, whose book 'A Mathematical Theory of Communication' published 1949 presented information theory for the first time, and suggested it was a branch of mathematics concerned with the transmission of digital data; the term bit, referring to the Boolean algebra digits 1 and 0 employed in computer programming, was also used for the first time (The Telegraph 2016).

The OECD (1996, p.7) report stresses the importance of developing appropriate science, technology and industry policies to optimise well-being and performance in economies based on the production, distribution and use of knowledge and information; education and training are cited as being required to exploit the associated productivity and economic growth. In education an appropriate mindset was necessary to enable the development of skills and knowledge to accomplish performance goals.

Globalisation is a fundamental characteristic of contemporary economies and education the source of national economic growth, as stressed by President Obama in 2010, but the current education system continued to fail to produce enough graduates in the relevant specialisations and, therefore, education needed to change. The consequences of failing to align education with the skills required in the labour market were that competing nations, which had implemented educational changes appropriately, would outperform those that did not (Anderson 2010). Hence, Obama emphasised that the type of education that children received was arguably the most important economic issue at this time in history, because individuals, who have not gained higher education qualifications were twice as likely to be unemployed, and of the new types of jobs being created 80% required higher education or specialist workplace training (Calmes 2010). Consequently, a nation's educational system should match societal changes, so that children were sufficiently prepared for the environment in which they will experience adult life.

Instead, a time-based approach to education is taken in most countries, in which all students progress by age and, since the curriculum is fixed, it is not challenging for

some students resulting in boredom, whilst for others it is too fast, and this group move to next school year without having accomplished the associated fundamental knowledge/skills (West 2013). The approach should be altered from time based to achievement based, according to Reigeluth and Karnopp (2014) and, therefore, it is not surprising that employers, international business leaders and academics suggest that schools are merely self-serving institutions (Peters 2003a; Cuban 2013; Reigeluth & Karnopp 2014).

In this perspective, the education system in the UAE should reflect the objectives of creating a knowledge-based economy, and potentially adopt a different approach from the time-based concepts. However, Playfoot and Hall (2008) observed several other barriers to the UAE accomplishing the knowledge economy goals; no vocational education existed for UAE nationals before 2006 and it was still very limited; the higher education system was characterised by theory and so little practice that graduates failed to have the capacity to apply their knowledge; communication skills were poor, including levels of English unsuitable for operating in a commercial environment; lack of confidence and/or critical thinking to make decisions, instead relying on senior managers; diverse education systems in the individual UAE states. Therefore, UAE businesses compensate by implementing their own education programmes; no liaison occurs between business leaders and educational policy makers or implementers.

The mismatch of education based skills for the UAE knowledge economy is also typical of international labour markets, according to Malone, Laubacher and Johns (2011), who suggest that in the future, the degree of specialisation each person will contribute to the end product or service will increase, so that lack of skills in one location is less critical. The process required to achieve this environment is that jobs undertaken previously by one person would be subdivided, so that each individual fully employed his/her specialist skills; this type of approach to work referred to as hyper-specialisation. This concept is considered to reduce the difficulty of recruiting individuals in skills shortage categories, for instance salespeople, engineers and accountants; the skilled person delegating and supervising the lower skilled aspects of the work. It also increases productivity because less time is wasted by individuals with poor skills in a specific aspect of production contributing to its completion

(Malone, Laubacher and Johns 2011). The implication is that each individual would possess a range of key specialisations, and this would vary so that collectively the whole skill set required could be accessed by the employer, to optimise productivity (WEF 2019).

The lack of local and global alignment of education policies with labour market needs, suggests that proposed new school models including education curricula, fail to reduce the gap between skills learnt and those required to transform to a knowledge economy. However, this problem may be partly a consequence of absence of an agreed definition of the specific nature of the skill set, and how a public education system could generate the desired outcomes (OECD 2001). The transformation of skills required can be compared to the era of change from handwritten to printed material but making sense of huge amounts of information from diverse sources is one of the fundamental required skills (Bellance & Brand 2010). The inference is that the skill set for the knowledge economy must be fundamentally different, but doubt remains as how to shape it appropriately. The essence of change is the "ability to spot and act on problems at the earliest possible stage (Goldstein; O'Neill in Murphy 2009, p. 815) therefore this research is of importance as well, in addition to the UAE context research gap and the education system issues in a Knowledge economy.

The study conducted by Bellanca and Brandt (2010) suggested that the individual needed to develop five kinds of mind to be effective in the modern business context, three cognitively based minds, the disciplined, synthesising and creative mind, and two others related to human interactions specified as ethical and respectful; the tensions that existed between them would need to be addressed by appropriate development (Bellanca & Brandt 2010, p. 10). The disciplined mind is concerned with commitment to continuous learning, whilst the synthesising mind refers to the individual's capacity to search a wide range of knowledge sources and to identify and unify those most vital entities to resolving an issue (Bellanca & Brandt 2010). The synthesizing mind is a new concept for schools and rarely given attention to in psychology, according to Gardner (2010).

Psychologists propose instead that in order to think critically and to synthesise human beings need to have already stored facts in their long term memory, which is achieved

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by memorization; this concept is also proposed by Wilson (1988) who explains that without some background knowledge stored in the memory and experience with the specific concept, individuals will lack the capacity for synthesizing and critical thinking. However, ADEC (2011) education policy is to minimise rote learning, or memorising facts and encourage students to become independent problem solvers and thinkers.

Current educational initiatives in the UAE are predominantly imported from Western developed countries, and programmes designed and implemented with the assistance of international educational consultants acting as advisors to the UAE government (Kirk 2008; Executive Council 2007). The study by Ali (1996) stresses the degree to which Western principles have been exported to other countries but that they have often had little effect on their development, the implication being that they may not be suitable for the country. The major error is the perception that local management practices, which are integrated with the national cultural infrastructure, can be changed in an appropriate manner, since underlying values and beliefs of Emiratis do not always coincide with the Western ones (Diallo 2014). Therefore Ali (1996) proposes that organisational development in the Arab-Islamic world must be modified to reflect its traditions, its unique cultural goals and challenges. This is reinforced by Al-Ateeqi (2009) who states that neither these models nor pedagogical methods are adapted to the UAE context, culture or traditions.

The importance of education should not, however, be merely perceived in terms of human capital and the economic growth often associated with it, but also in terms of social justice, in other words providing inclusive educational access as a matter of social responsibility (Lister 2007). Social justice is concerned with the belief in the equal moral worth of individuals, such that frameworks should be developed to allow as many people as possible to become socially included (Fraser 2008). Social injustice can result in some of society's most talented, who have the potential to contribute most to the economy and society, being prevented from doing so because they do not have the resources. Instead those who have access to the required resources are able to take their place by participating in better employment, which hinders optimisation of economic outcomes (OSJSPM 2016). Social justice can only be accomplished by

eliminating the institutional barriers that exist and that prevent all individuals from participating in society equally (Fraser, 2008, p. 16).

However, the variation in meaning of appropriate education and development, and the informal networks operating at local, regional and national networks, influence the degree of social justice outcomes (Tikly & Barrett 2009). Education allows the development of capabilities that tend to be valued by individuals, communities and societies and social justice in education is concerned with how these can be constructed. Therefore, the range of inputs that will produce the required capabilities must be established, how the requirements and rights of different groups can be substantiated, and the interventions that could be employed to determine and to manage educational quality. Therefore, social justice represents a different and an additional rationale for how educational policy should be framed (Fraser 2008; Tikly & Barrett 2009).

The age at which individuals access quality education also has a vital impact on attitude to learning according to new research, which found that early learning experiences, shape the brain architecture regarding behaviours in later years (FTF, 2019). Investment in Early Childhood Development (ECD) generates high economic, social and educational capital (Heckman & Masterov 2007; UNESCO 2013; Copenhagen Consensus Centre 2014). The change in return on such investment decreases over time, figure 1, and is most prevalent before the age of three years; the return was found to be up to fifteen times higher this early stage than later (Copenhagen Consensus Centre 2014).

Therefore, these gaps will be further looked at from a business leader perspective as Peters (2003) explains the importance of the government, education sector and business sector working together in a knowledge economy. The government is providing policies to the education sector however the business sector is the final gap in the complex human chain involved and discussed in a countries transformation to a knowledge economy.

1.4 Research Purpose and Objectives

The purpose of this thesis is to gain deep insight into the role of education and the means of developing the skill set required to accomplish the UAE's ambition to be a leading knowledge economy; specifically, to Emiratis and from a business leader perspective.

The thesis simultaneously appreciates that there are likely to be insufficient numbers of Emiratis to deliver the knowledge economy given the mismatch between the size of economy and the number of Emiratis and that expatriates, whom might stay for a few years only are being educated in the UAE.

The necessary skills (Reigeluth and Karnopp 2014) and, therefore, the underpinning educational principles, processes, pedagogy and curriculum content, must align with government and educational objectives (OECD 1996) and those of the business sector as perceived by leading business executives, (Peters 2003ab) and subsequently be implemented by professionals in education (Cuban 2013. The nation's future prosperity is dependent on identifying the set of skills required by UAE nationals, and how education can be shaped to deliver them (Jones 2015). The skills, knowledge and behaviours and the associated options for education programmes to accomplish them need to be identified (Playfoot & Hall 2009), so that the UAE successfully transforms to a competitive knowledge economy. Once the outcomes required from the education programme are determined, an infrastructure to deliver it can be developed (Bellanca & Brandt 2010); a policy articulated for education to deliver future skills for the knowledge economy.

Therefore, there are three key aspects to the research problem: diverse philosophical perspectives regarding the role of education from government, educators and business leaders (Dixon & Dogan 2004); a source and a context issue because there are no agreed definitions of the contribution that education can make to development of the knowledge economy or of the skills (Brinkley 2006), knowledge and behaviours that must be acquired by means of the educational interventions; the existing academic literature related to 21st century educational models is western based (Bellanca & Brandt 2010). An additional gap is that the UAE economy remains largely dependent on its traditional 20th century oil-based economy and expatriate workforce and is attempting to transform its economy to be knowledge based (Nagraj 2015). As a

consequence, investigation into the specific set of skills, knowledge and behaviours that must be delivered by education to generate and continuously develop UAE's knowledge is essential (Schoning & Witcomb 2017).

The major objectives of this study are to:

- Identify the meaning of the Knowledge Economy in general and in the context of the contemporary UAE labour market,

- Establish the accomplishments and limitations of current UAE educational provision in relation to developing the skills set required for a knowledge economy,

- Appraise the strategic partnerships that have been formed between business leaders in the UAE with government, regarding educational policy and practice at all levels, and with the tertiary education sector, as a means optimise the potential to accomplish a knowledge economy,

- Determine the current labour market context from an Emirati perspective, relating to skills and knowledge required for knowledge economy, and the relative motivations and limitations for employing Emiratis and expatriates,

- Establish the precise perception of business leaders regarding the role of education in generating the skill set required for the UAE's transition to a knowledge-based economy.

1.5 Research Questions

The role of education in successfully supporting the achievement of the UAE 2021 vision is subject to resolving several major challenges, which include the local education infrastructure, cultural values, and shaping an educational policy that also considers global trends in education and business, which impact on economic success (Bellanca & Brandt 2010). Therefore, the research question is:

What is the perspective of UAE's business leaders regarding the role of education in generating the skill set required by the labour market to enable the UAE's transition to a knowledge-based economy?

In order to ensure that the main question can be answered with sufficient depth and detail, four sub questions must be answered:

SQ1: Which skills, knowledge and behaviours are required in UAE's transition to, and continuing development of, a knowledge-based economy?

SQ2: What is the precise nature of the gap between the skills, knowledge and behaviours of the Emirati and Expatriates work force and that required in the UAE knowledge economy?

SQ3: What opportunities and challenges exist to enabling education to contribute effectively to UAE's transition to a knowledge economy?

SQ4: What is the involvement of Business Leaders in influencing UAE Government as well as Universities to ensure that curriculum design and outcomes meet future labour market needs?

1.6 Research Hypotheses

The research questions in section 1.5, can be answered to a certain extent by qualitative methods alone, which provide subjective insight into issues concerned. The hypotheses are based on the interview questions due to the existing research gap, mentioned in the introduction part. Combing the qualitative nature of the role of the education questions and the quantitative nature of the needed skill set questions, this methodology with the testing of hypotheses, a mixed methods approach, minimises the theoretical weakness of the single methodologies and resolves the research problem in the most holistic way (Creswell & Creswell 2018). Hence, hypotheses are generated, and their validity proven or disproven (Saunders, Lewis & Thornhill 2015).

Hypotheses:

H1: The most important skills for creating and sustaining a knowledge economy are similar to previous studies

H2: The required critical skills in the UAE's transition to a knowledge economy are not available

H3: The UAE schools and universities do not generate graduates with the requisite skill set to meet current and future labour market demand

H4: The critical success factors for school and higher educational establishments to support the knowledge economy are not in place

H5: Business leaders in the UAE have not formed diverse types of strategic partnerships with UAE Government and universities to ensure that curriculum design and outcomes meet future labour market needs

1.7 Rationale for the Study

The relevance and importance of this research is to narrow the research gap regarding Arabic countries as at the current population growth rate the Muslim population will represent fifty percent of the world's population by 2050 (Case, Hopfl & Letiche 2012). The few studies that have been published tend to generalise across the twenty-two Arab countries, which are at various development levels, according to Branine (2011).

Furthermore, as schools are an embedded part of culture the Emiratis identity is firstly based on religion, values, language and community (Haque 2007) and the imported education models might differ along the same variables. Therefore, there is a need to look into the challenges of the UAE transforming from an oil-based to a knowledge-based economy as loose links between cultural communities and individuals might cause distress.

Finally, in order for the transformation to succeed, the government, education and business sector need to work together (Peters 2003a). The government, with the support of consultants, make the strategies and policies and the schools implement them. The researcher has already undertaken research regarding the teachers' perspective on the implementation of the new policies and worked with consultants regarding the same. So diminishing the existing gaps in the literature regarding business leaders' perspectives on education as a major driver for knowledge economy skill set acquisition and, in particular that of UAE business leaders. This study makes five major contributions to existing knowledge: business leaders' perspective on education, triple helix; 21st century skills in the UAE context; the role of education in UAE; a snapshot of the current progress of transition to Knowledge Economy; the gap that must be closed to accomplish the knowledge economy. These aspects justify the thesis.

Culture is transmitted through the generations; therefore, this thesis affords an opportunity to gain deeper insight into how skills, knowledge and behaviours of Emirati nationals required in the knowledge economy workplace can be aligned successfully with the UAE cultural and religious norms. Since the interventions required to generate the skill set required for the knowledge economy must be initiated in the educational context, considerable understanding of the outcomes

required from education programmes must be gathered so that infrastructure developed to accomplish the outcomes, whilst matching them to essential cultural preferences in both public and private schools. This is a challenging prospect because the UAE Ministry of Education, sets the educational curriculum specifically for the public schools, but the inference is that this thesis could be of significant value to the authorities to align business, educational and economic goals. Therefore, the findings from this research study may be useful as a tool to inform policy makers, a source of ideas for curriculum development and infrastructure in public and private education at all levels as well as for corporate training.

1.8 Structure of the Dissertation

The thesis comprises six chapters, the first is this Introduction, which provides an outline of the research, its major objectives and the related research questions that must be resolved and hypotheses to be proven. This Chapter also integrates the background to the research and the motivation for undertaking it, its value to existing knowledge generally and to the particular context of the UAE's ambition to transform to a knowledge economy. The second chapter is the Literature Review, comprising a conceptual analysis, identification of the major theories and concepts that underpin the study, and a critical appraisal of previous studies that are similar to this research. This process enables the researcher to identify the most important theoretical findings and, therefore, to identify the gap in knowledge that this thesis will explore. The two main themes in the Literature Review are concepts relating to the UAE context, for instance the economic importance of successful transition to the knowledge economy, the specific cultural context, and the educational and pedagogical concepts that are related to developing educational programmes that will equip students to fully participate in the knowledge economy, and ensure that UAE achieves its goal of competing in the global context. The methodology for the study is presented, discussed and justified in Chapter Three and commences with a discussion of the stance taken to the research, which directs that research design and approach, and when these have been established a data collection plan is devised comprising the method, context, population and participant sample. Hence, the research instruments and the rationale for their choice are discussed, including that associated pilot studies to validate them, followed by the data analysis and interpretation plans. The limits of

the research, ethical considerations and the techniques to optimise the reliability and validity of the findings are documented. In Chapter Four, the findings from the quantitative and qualitative analyses are presented, analysed, discussed and summarised, whilst in Chapter Five the study is summarised. Therefore, the final chapter revisits the major findings and indicates the extent to which these have supported answering the research question and testing the hypotheses. Recommendations are devised from the theoretical and empirical findings and the theoretical, methodological, empirical, practical, educational implications of the study are determined. The limitations of the research, the challenges encountered in fully resolving the research questions are considered and, therefore, the scope for additional future studies suggested. The thesis finishes with reflection on what the thesis claims to have accomplished and the researcher's conclusions.

CHAPTER TWO: LITERATURE REVIEW

2.1: Chapter Overview

The purpose of the Literature Review conducted in this Chapter is to provide the thesis with the theories and gaps that enables this researcher to refine the research questions and to devise suitable questions to pose to participants so that the research questions can be answered (Hart 2010). A review enables the research to understand the strengths and weaknesses of previous studies, to find the gaps in existing knowledge and therefore, wide and deep coverage and synthesis of the major concepts is required, their relative significance to the current research acknowledged and the politics of the author recognised as appropriate. The overview of the conceptual analysis of the thesis will be discussed in order to provide the big picture and then continue with the theoretical framework. The theoretical framework will provide an in-depth analysis of the crucial themes; knowledge economy, skills needed as well as the role of education globally and in the UAE. The last sub sections will provide a review of related literature and situate the current study.

2.2 Conceptual Analysis Overview

The framework, for this thesis comprises the categories recommended for education-based dissertations by Boote and Beile (2005) who suggest that Literature Reviews tend to be relatively weak in doctoral dissertations; the major theoretical aspects are connected in figure 2.

Figure 2: Literature Review Framework
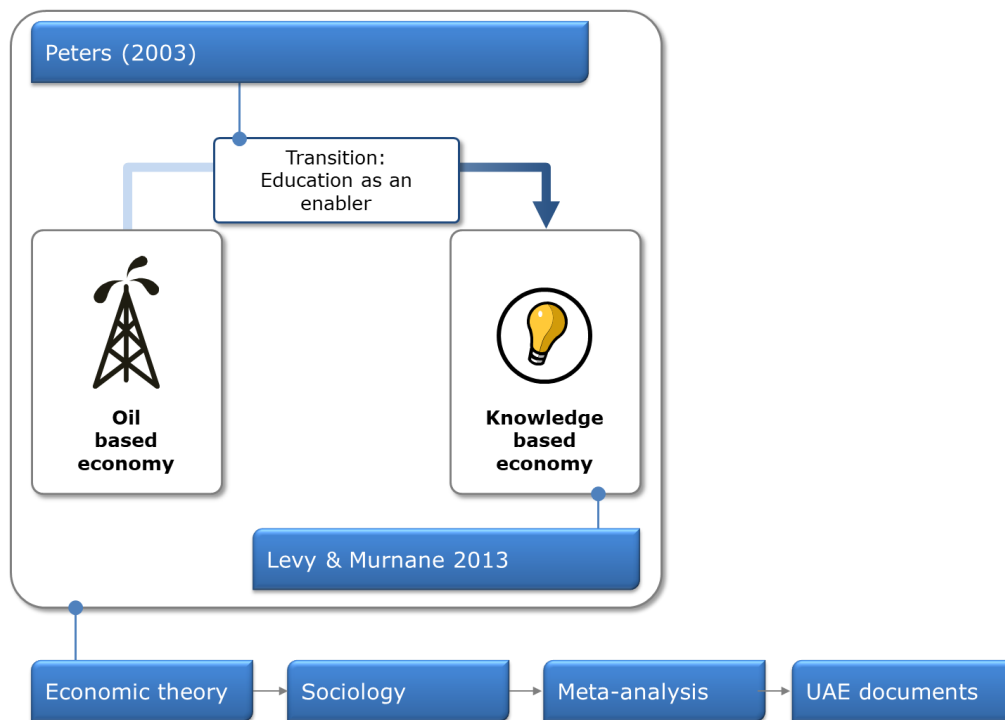
Source: Author

The theoretical framework is influenced by economic theory, sociology, an analysis of the required future skills and knowledge, which means conducting a rigorous qualitative evaluation of existing relevant primary qualitative findings (Timulak 2009), and UAE related documents, for instance government strategic plans associated policies, diverse studies on the aspects pertaining to achieving its economic goal.

Economic theory is described in various ways (Vickrey 1964) but one of the most relevant descriptions for this thesis is that it relates to gaining deep insight into the processed for optimising outcomes from finite resources when there are competing

can be defined as the study of the processes by which scarce resources are allocated to accomplish competing objectives. Therefore, for the purpose of economic analysis, these resources are characterised by being measurable and transferable. Economic theory is also perceived as a logical system comprising assumptions and the associated conclusions generated, in a similar way to the derivation of a theorem. It has developed to explain the successes and failures relating to development, for example in relation to developed and underdeveloped countries. Some countries are

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more developed because: they allocate their resources effectively between research and development and manufacturing or between new and traditional industry sectors; they create institutions to support development such as insurance institutions, incentives and method of enforcing specific contracts; the level of skilled labour. Successful economic development, therefore, depends on a set of appropriate behaviours, but transforming an economy into one in which all the requisite behaviours exist does not occur without systems devised to ensure they are acquired in a coordinated manner (Hoff & Stiglitz 1999). Global economic theory relates to global or macroeconomic policies and local or microeconomic policies, both of which are concerned with trade, capital markets, finance such as balance of payments and currency exchange, labour productivity and therefore Gross Domestic Product (GDP) and per capita GDP (Krugman & Obstfield 2018).

The major concepts related to economic theory in this Literature Review are concerned with the economic models, specifically the implications of a transformation from an industrial economic model to a knowledge economy model and the related labour market changes. The knowledge economy concept is not well-defined, since it has specific meaning for different groups, and perhaps Bell (1976) provides a broad perspective that describes it most effectively in general terms. Knowledge economy represents a transformation to a post-industrial context, in which theoretical knowledge is the basis for innovation and this implies different types of workplace practice, the most important being interpersonal communication to exchange information in real time on a global basis. The inference is that the most important strategic resource is human capital, and that education, science and technology, access to social networks and entrepreneurship were also key aspects of labour market needs.

Therefore, the meaning of the knowledge, the means by which knowledge is acquired and transferred must be appraised and the vital skills required to accomplish a knowledge economy defined. In the UAE context, the types of industrial sector that comprise its knowledge economy are important and stated by a British Council report (BC 2018) to be manufacturing, travel and tourism, trade and logistics, financial services, technology, media and communications, and energy and petrochemicals. Therefore, this change of economic focus from an oil-based economy has implications

for educational policies, theories and practices, which are additional concepts that must be appraised from an economic and a sociological perspective.

Sociology is a discipline that seeks to explain the meaning of culture, socialisation and identity so that greater understanding of how the world works can be deduced. Therefore, social change that results from new technologies, faster communication and other phenomenon that impact on behaviours and customs of individuals and groups are of particular interest to sociologists (Punch et al. 2013). The American Sociological Society (2019) refer to sociology as a scientific approach to understanding the individual, national and global patterns of social relationships, social interactions and culture so that the social processes that impact on behaviours, feelings and mind sets can be understood. In this context each individual is assumed to demonstrate patterns of behaviour and is able to make choices, and sociological studies also support decisions about the type of choices made within a given set of social forces experienced by the individual or nation, for example. This description of sociology is broad and very important to this thesis, as the context of the study is multicultural. Collins (1994) also argue that the sociological traditions; for example, conflict theory with Marx and Engels, Rationalism with Adam Smith and Durkheim have the competition element in common which is an important factor in a knowledge economy as well as Durkheim's theory of specialization in people dense societies. Furthermore, Durkheim highlighted the importance of strong links between cultural communities and individuals as loose connections might cause distress as the importing of western education models might cause to students in the UAE as these policies are made by and for another culture. According to Haque (2007), religion is the most important variable in Emirati students' lives and identity. The majority do not reject importing western based models as long as they are adapted to the local context. The conclusion of the author is that the various perspectives between Emirati and western based models and culture cause conflicts. This on the other hand will cause issues for UAE's transition to and sustaining a knowledge economy.

In regard to theories and concepts relevant to this thesis, national and organisational culture (Hofstede, Hofstede & Minkov 2010) is a vital element, in respect to the labour market and educational expectation and outcomes. The process of defining educational policy and practice generally and specifically for the knowledge economy

are also associated with the sociological aspects of this research. Policy is described by Colebatch (2009) as a sensemaking concept, which enables policymakers and spectators to gain a better understanding of complex ideas associated with governing and multiple layers of human chains (Cuban 2013). Educational policy can be devised from a number of philosophical perspectives, according to Dixon and Dogan (2004), the extremes of purely objective or subjective and the continuum of diverse proportions of each (Collis & Hussey 2014). In this thesis, concepts of policy are complicated by the need for business and educational leaders to share responsibility for policy making, so that different ideas on ethics, values, motivation, risk taking, human disposition and balance of power influence how valid information is interpreted and decisions made (Dixon & Dogan 2004). The educational policy framework that emerges from this thesis is one of its major outcomes, and therefore a critical appraisal of policy and policy making is fundamental to understanding the economic, political and sociological context and justified for inclusion in this Review. Shore et al., (2011) states that previous research has focused on group diversity and multiculturalism but since recently scholars focus on inclusion in multicultural organizations.

The analysis in the conceptual model refers to systematically appraising previous research in a specific subject discipline that enable conclusions to be made about research in it, which is more detailed that any single study could provide. Meta-analysis therefore represents an aggregated analysis, typified by its heterogeneity, including conflicting perspectives of a large quantity of published literature. If an insufficient range of studies is included in the analysis, imprecise or faulty conclusions may emerge (Haidich 2010). This analysis resembles a systematic review of existing studies and often includes an indication of the relative occurrence of specific findings, which demonstrate the convergence previous outcomes (Basu 2017). The process is characterised by several stages: devise a research question(s); search relevant and reliable databases; read abstract and title of each search result; select final articles that are most important to answering the question; establish the quality of each work selected; assume that the studies identified are a subset, a random sample of all studies available; draw conclusions from the aggregated findings; assessment of a balanced perspective on the issue.

The analysis will comprise two parts, the predominantly theoretical aspect relating to skills required for the knowledge economy and the implications for the labour market globally. A major text in this regard is 'The New Division of Labor: How Computers Are Creating The Next Job Market', researched and written by Levy and Murnane (2004), which discusses how computers and the development of digital technologies have created changes in the type of labour required in the workplace. The division of labour being described as dependent on the size of the market (Smith 1776), the extent of which has rapidly increased over time owing to advances in technology, with digital technologies being the nature of work that is required to produce the goods demanded (Levy & Murnane 2004).

The change in skills set required for a new workplace was suggested as being predominantly derived from altering the educational policies and practices, since employers would generally avoid training costs to develop new skills, owing to the risk of employees leaving the organisation, leaving it lacking in those skills. However, the nature of education and testing outcomes, tended to rely on standardised tests, which could not assess the types of human skill required in a digital age, such as critical thinking and advanced communication skills, so that educational reform was required that comprised new educational process and practices including pedagogy (Levy & Murnane 2004).

This description of the text demonstrates the intricate links between economic development required by the UAE, the skills it must develop in its labour market and the implication that initiating the acquisition of these skills must be an educational strategy from an early age if the knowledge economy goal is to be achieved. This is, particularly crucial if, as Levy and Murnane (2004) suggest, employers in the UAE perceive that learning and development of their employees is not their responsibility.

In the second part of the Literature Review, the focus is on a review of studies related to these major concepts, an analysis that considers: the UAE context of the knowledge economy, its current accomplishment towards transforming to a knowledge economy measured by independent sources; global and UAE education policies and practices that have been designed and implemented with the purpose of generating a knowledge economy; the challenges that UAE must overcome to accomplish its economic goals, which are based on Emiratis holding major positions in the private sector in particular

and generally making a significant contribution to the UAE target of becoming a knowledge economy by 2021 (UAE 2010; Warner & Burton 2017).

 The research by Peters (2003ab) are key texts because they focused on public policy relating to education, particularly higher education, which was considered to be the most critical stage of the formal educational programme that impacted on generating a knowledge economy; links with business and industry being considered vital for higher education establishments to deliver the appropriate skills sets. The Levy and Murnane (2013) research report on skills that will be associated with successfully completing work task in the future is also indicative of the nature of skills, integrating and interpreting diverse types of information to resolve complex problems for which current procedures do not exist at present.

2.3 Theoretical Framework

2.3.1 Definitions of Knowledge

Knowledge is derived from information and data, which has been given a specific context that provides it with meaning or a purpose, such as a set of numbers with personal details that reveal the date of birth. Data is described as any objective fact or observation that has no associated context, a set of numbers or words written on paper or stored in a computer. Data interpreted in a specific context becomes information and then knowledge as the reader makes sense of it (Barnes 2002). Hence, Ackoff (1989) proposed that data comprised symbols representing objects or events and that information was processed data.

A major issue with data is that it can be interpreted in a number of ways, which are dependent of the values and experiences of the reader or person listening to the data as it is spoken; the individual makes links between the data observed (Rowley 2007). Hence, the knowledge derived from the data differs, and the context in which the spoken word is heard adds another dimension, because observing the speaker physically impacts on interpretation, as does voice intonation whether the speaker is observed or not (Barnes 2002). The study by Rowley (2007) represents a review of the terms Data, Information, Knowledge, Wisdom (DIKW) from diverse perceptions, a hierarchy of concepts that is useful to this thesis because it provides a context for the complexity that individuals and groups encounter when attempting to decide on an educational policy, and the required, associated knowledge and skill outcomes that must be accomplished by delivering an agreed curriculum; each of these three stages is influenced by the perception of knowledge and wisdom (Rowley 2007).

Data tends to be described in information systems and knowledge management textbooks but definitions are not always provided; overall, data is described in the same way as indicated earlier in this section, but words such as raw (Choo 2006) disorganised and elementary are employed to explain it or recorded descriptions of objects, facts, activities, transactions (Rowley 2007). Another approach is to describe data as elements of larger systems, for instance instrument panels and books that provide the observer with ideas, about which data should be identified and how it should be read (Choo 2006). This is not a useful definition, because it does not provide a fundamental meaning for the term, rather it infers that it is no longer a raw,

unorganised symbol. Data is also regarded as being derived from a signal, which the observer senses, selects and transforms to data, ideas which differ from earlier perceptions of data (Choo 2006) and that this researcher recognises in terms of Industry 4.0 cyber signalling (Lee, Kao & Yang 2014), and this is an important concept in the knowledge economy era.

The organisation's values determine the type of data collected, which is systematically gathered, who has access to it and who is concerned with it (Choo 2006); the organisation can be regarded as a large system. This is an interesting perception for this research because of the implication that each of the major stakeholders in the development of educational policy for the UAE knowledge economy are likely to gather different sets of data, and may not choose to share certain data, which tends to weaken shared, appropriate policy making and therefore exposes a gap that the researcher may need to address.

Information was regarded by authors of information systems and knowledge management texts as organised or processed data but also described in a variety of ways (Rowley 2007), which are generally very similar. Information was considered as data that added value to understanding a subject, had meaning for the individual, and was processed for a specific purpose (Rowley 2007) and Bocij, Chaffey, Greasely and Hickie (2003) suggest it was data that had been interpreted and understood, which tends to extend the description. They also suggest that the conversion of data to information requires classifying, rearranging, aggregating, calculating and selection but Rowley (2007) emphasises that the study makes no mention of how these processes will be performed, implying that machines or humans or both may be the means.

The subjective interpretation of data is considered in many information systems texts, for instance its relevance is not likely to be perceived equally by different individuals, and data may not be perceived as information by some observers (Boddy, Boonstra & Kennedy 2008), as was identified with original data concept. Information could be inferred by studying data according to Fricke (2009), with an example of requiring the average temperature for which there was no data, but that the individual could obtain the data from records of the monthly data available.

As indicated by the diverse interpretation of data that represents knowledge, Rowley's (2007) review of the literature found that studies defining knowledge regarded the

task as considerably more complex than defining data or information. Knowledge management texts varied in their approach to defining it, for instance some provided philosophical interpretations and others used practical examples, aligning with Barnes (2002) that was an extremely ambiguous term, and Jashapara (2005) that no rational description could be agreed. Information systems texts linked knowledge to data and information, for instance knowledge comprised data, information and expert opinion, skills and experience, or that it was data that the human mind had reflected on, analysed and considered in a specific context (Rowley 2007); previous learning was also mentioned as factor in generating knowledge from data (Rowley 2007). The transformation of data or information into knowledge was implemented practically by asking questions, for instance how, what or why (Fricke 2009).

Wisdom was mentioned in only three of the fifteen texts appraised by Rowley (2007), although it is considered to be derived from data, information and knowledge, and as the highest-level application of them. Wisdom is referred to as knowledge developed over time by Jessup and Valacich (2003), so that knowledge gained in one period is employed to explain or give context to new information, problems and environments. It is considered to be a competence that enables critical thinking, a practical approach to new information, which integrates ethics based on the individual's set of values (Jashapara 2006). The few papers that discuss wisdom is also emphasised by Fricke (2009), who suggests that many authors focusing on knowledge concepts do not consider it has relevance to their subject matter.

Wisdom is attributed to an individual, who possesses diverse types of knowledge, rather than an accumulation of facts regarding one subject area. Therefore, a wise person is one with knowledge and understanding of a variety of subjects, life's most important objectives and values, and how these can be accomplished without excessive costs; s/he will identify and minimise risks and obstacles, assess what it impossible to achieve, have capacity to understand the real motives of others and how to self-manage life's main tragedies and ambiguities. Wisdom is applied to extremely difficult practical problems and concerned with ethics and how to act in a given situation (Fricke 2009).

These descriptions of data, information, knowledge and wisdom are all relevant to resolving the research questions for this thesis, since they indicate skills that individuals will require to evaluate, to assimilate and to employ in decision making

but equally to be highly critical of the sources and interpretation of data, and the motivations that underpin how individuals and organisations present them.

A slightly different hierarchy, figure 3, is presented by Bender and Fish (2000) in which expertise rather than wisdom is the highest layer, and this can be aligned with superior knowledge referred to by Fricke (2009) as know-how, knowledge that cannot be easily explained or documented. Two types of knowledge are inferred in the DIKW hierarchy, weak knowledge that can be recorded and explained and know-how (Fricke 2009). The wisdom in the DIKW hierarchy developed originally by Ackoff (1989) was based on systems theory and referred to knowing how to control systems, a practically based skill, that relates to know-how knowledge, according to Fricke (2009) and, therefore it would correspond to expertise in this model.

Figure 3: The Knowledge Hierarchy
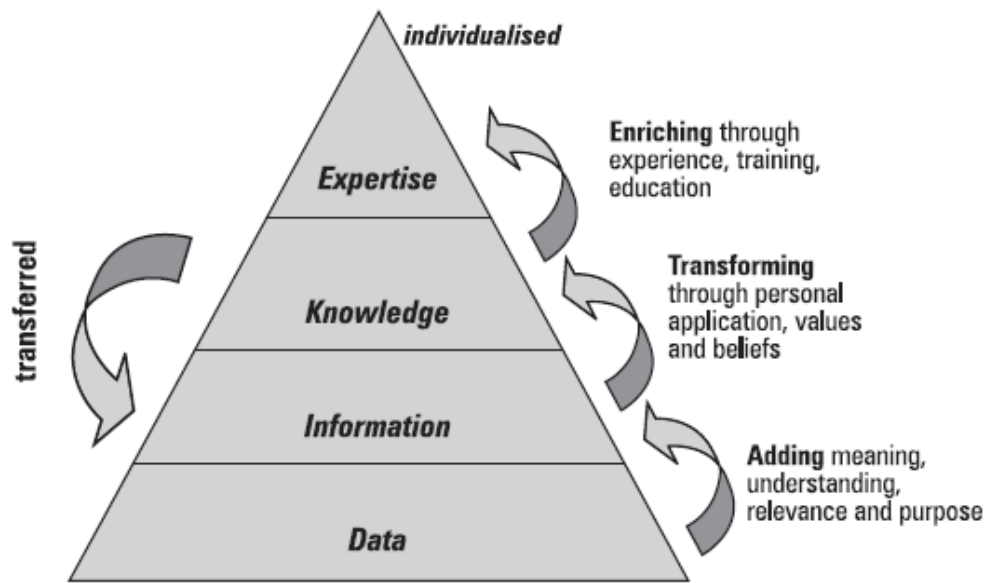
The knowledge hierarchy again comprises four stages with the links between data, information and knowledge, indicated and explained in figure 3, being similar to the DIKW model from which it was derived. Knowledge was defined by Bender and Fish (2000) in terms of ideas, data and techniques that the individual had stored in his/her memory, and consequently unique, because of the different experience and values sets each person accumulated over time. Expertise was differentiated from knowledge as being highly specialist, deep knowledge and understanding in a particular subject, which far exceeded average. This individual capacity inferred that s/he could create new knowledge and solutions in this specialism, and expertise was gradually attained from education, training and experience over many years, beginning at zero. Hence the parallels between wisdom, as expressed by Ackoff (1989), know-how knowledge by Fricke (2009) and expertise are evident.

An interesting observation is the difference between data and knowledge offered by Boddy, Boonstra and Kennedy (2008), which is that data is a property of objects, whereas knowledge is a property of people, with information being data processed by technology or humans, and therefore inferring that information could be objective or subjective information respectively. In respect to this study, the proposition that individuals use knowledge in order to generate more efficient use of resources than

those not possessing it, is highly relevant. Those individuals, who possess knowledge are able to accomplish greater effectiveness because they can identify patterns, investigate the reasons for them and accomplish better decisions (Boddy, Boonstra and Kennedy 2008).

2.3.2 Knowledge and Skills

The two types of knowledge identified in section 2.3.1 are often referred to as explicit and tacit knowledge, tacit knowledge also associated with high levels of skills. Tacit knowledge, therefore, has two dimensions (Smith 2001) namely technical and cognitive knowledge, which comprises intuition and insights, subjective factors that infer it is linked to the individual's value set, emotions and experiences to date. Technical knowledge aligns with know-how, crafts, skills or personal abilities, and is associated with high levels of specific knowledge or skills, such as those possessed by expert craftsmen and craftswomen (Smith 2001). Technical tacit knowledge guides the individual into sensing what skills are needed for certain circumstances (Nonaka 1994). Cognitive tacit knowledge was associated with how the individual perceives his/her environment, the mental model or paradigm which is a deeply embedded and often represents an unconscious set of beliefs, that shape opinions regarding the phenomena observed (Nonaka 1994: Schein 1991). Cognitive knowledge reflects the individual's perception of reality, ontology, and his/her vision of the future, which is important for creating new knowledge, and involves verbalising the tacit cognitive knowledge. The diverse mental models that individuals have developed are the reason for tensions between them, owing to conflicting value sets and experiences (Smith 2001; Nonaka 1994).

Explicit knowledge was associated with words or numbers in a printed form that an individual can access and read; explicit knowledge increased over time as the individual read more documents (Nonaka & Konno 1998); explicit knowledge is the weak knowledge referred to by Fricke (2009). Since explicit knowledge can be expressed as words and numbers, it is easily shared with others, for instance through written instructions, formulae and background informational documents, and traditionally stressed by western cultures, in contrast to Japan where tacit knowledge is more important (Nonaka & Konno 1998). Tacit knowledge is also acknowledged as personal to an individual by Nonaka and Konno (1998), who propose that individuals

can increase their level of skills transfer generated by interaction with others, but tacit knowledge is hard to communicate.

The comments on different cultural emphasis on the two forms of knowledge by Nonaka and Konno (1998) are important in the educational context, and consequently for this thesis, since the explicit form of knowledge has traditionally been the basis for educational testing, and explicit knowledge can be associated with the instructional mode of teaching, whereas tacit knowledge aligns with the shared learning techniques (Eraut 2000); the studies suggest that both forms are required explicit facts, and tacit skills and application of facts.

In the educational context, Eraut (2000) identifies several ways that students acquire knowledge, referring to formal and informal learning situations. The formal learning environment is characterised by a prescribed curriculum framework associated with formal learning content, the presence of a specified teacher, a credit or award received on completion and outcomes specified by an external body. Non-formal learning comprises deliberative and implicit learning, which are described as time scheduled for learning and knowledge acquisition, which occurs whilst the recipient is unconscious of it, respectively. Implicit learning, as described by Eraut (2000) has time implications, with the learner using memorised learning from past experiences, selecting specific experiences to link with current phenomena, which shape future behaviour in an unconscious manner; tacit knowledge, therefore enables future actions by employment of the episodic memory. The episodic memory stores practical experiences, whereas the semantic memory stores public propositional knowledge (Eraut 2000), which is found in libraries and databases (Miller 2018) and therefore explicit knowledge.

Therefore, this tacit knowledge process is important to educational design in the UAE context, because Eraut (2000) emphasises the opportunities for communication, diverse events and experiences, and reflection on them. It is stored in the episodic memory as opinions, impressions and ideas that can be employed in future decision making and problem solving. A model for how the brain stored the different types of knowledge is illustrated in figure 4.

Figure 4: Memory Structures and Knowledge Acquisition Explaining Tacit Knowledge
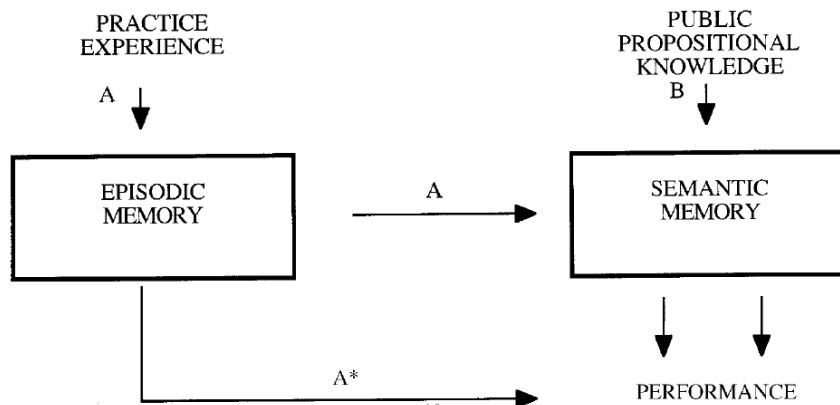
Path A in the diagram is associated with experiential learning events, in which the person observes others, and the brain stores the experience in the episodic memory. Path A is implicit learning, which is activated when the knowledge is already stored in the episodic memory and influences performance using generalised knowledge. In contrast path B relates to gaining general knowledge from others (Eraut 2000).

The 'non-formal' learning described by Eraut (2008) is also acknowledged as aligning with the idea of tacit knowledge, as proposed by Polayni (1958) because there are so many ways in which tacit learning is expressed by authors. Tacit knowledge, also expressed as personal knowledge, has three aspects: valid knowledge of a problem, the capability to resolve it in a scientific way, which relied on a certain sense of knowing how to approach, and then to sense the implications of the outcome. Tacit knowledge was a core part of knowledge and provided the possessor with the sense of what to look for, and to have an idea of what else s/he needed to know (Polayni 1958). Non formal learning as expressed in these contexts is vital to solving complex problems, which are associated with this type of uncertainty and intuitive approach (Greenhalgh 2002).

2.3.3 Knowledge and Skills Transfer

Organisational knowledge is created from the collective knowledge of employees by the process of assessing the level of knowledge each individual possesses, extending and expanding it, and connecting it to an organisational knowledge system (Wang &

Ahmed 2003). This infers that the organisation must actively discover what knowledge individuals assimilate individually, what the sum of that knowledge is, and how it can be developed to benefit the organisation and to provide competitive advantage. Hence understanding the process of transferring knowledge is crucial and is a rapidly advancing science (Nonaka).

New knowledge is created by individuals, whilst the ideas are developed by interaction between individuals, and organisational knowledge is expanded by exploiting and extending it; knowledge creation occurs as a consequence of the continuous interaction of the tacit and explicit knowledge (Nonaka 1994). The interactions between individuals may occur within or beyond departmental or functional boundaries, and the quality of knowledge created is dependent on the extent of social interaction between the participants and considered to be the ontological aspect of knowledge creation. It also depends on the extent to which individuals are motivated to create knowledge and for what reasons, such as how autonomous they can be in doing so. Then knowledge develops in a pattern similar to a spring, since the ideas pass between individuals, become clarified and are finally accepted as knowledge, the epistemological aspect (Nonaka 1994).

Four modes of knowledge creation are involved in new knowledge generation transfer: from tacit knowledge to tacit knowledge; from explicit knowledge to explicit knowledge; from tacit to explicit knowledge; from explicit to tacit knowledge. The knowledge creation model is referred to as Socialisation, Externalisation, Internalisation, Combination SECI (Nonaka 1994).

Table 2: Knowledge Creation Methods

	Tacit Knowledge to **Explicit Knowledge**	
Tacit Knowledge from Explicit Knowledge	Socialisation	Externalisation
	Internalisation	Combination

Source: Adapted from Nonaka (1994, p. 19)

The modes of converting knowledge into the different forms were described as self-transcendence by Nonaka and Konno (1998) and, in relation to transferring personal

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knowledge, this inferred that the individual possesses the personal motivation to improve what s/he knows. There is no need for verbal communication between individuals to transfer knowledge, it can be achieved by one individual observing another, imitating the owner of the tacit knowledge and practising the skill, and/or by examining photographs or images, for instance. The essence of this mode of transfer is shared experience (Nonaka 1994). Therefore, socialisation is vital to sharing tacit knowledge between individuals, and demonstrates the fundamental role joint activities have in this process.

This concept is further demonstrated by the observation that long term work colleagues have an intuitive understanding of how others in the group think and act, can empathise with their perspectives, and the context in which it has developed, shared space, which could occur by means of teleconference and emails, according to Nonaka and Konno (1998). The concept of 'ba' is further discussed by Nonaka and Toyama (2003), who proposed that the shared space must be associated with meaning, so that information can be interpreted and converted to knowledge.

'Ba' was a space characterised by energy and quality, in which new knowledge emerged from existing knowledge, because its meaning and context changed; 'ba' should not merely be considered as physical space but as multiple ways of interacting that included informal circles, electronic communications and project teams, for example. Therefore, 'ba' could be perceived in different ways, figure 5, as physical, virtual and existential, referring to sharing contexts and interactions to create new meaning (Nonaka & Toyama 2003).

Figure 5: The Context of 'Ba'
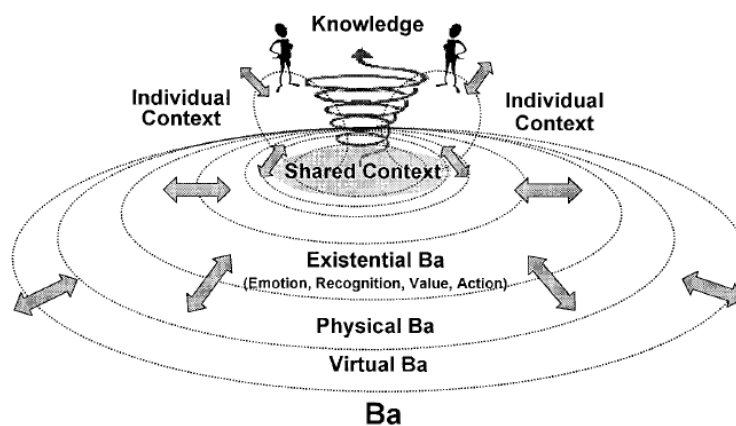
Source: Nonaka and Toyama (2003, p. 7).

An organisation could be considered as a collection of 'ba's in which different groups interacted to produce new knowledge, because the organisational structure was organic, those with the required knowledge were identified and environments created for it to be shared. Equally organisational structure could hinder the capacity for 'ba', restricting new learning (Nonaka & Toyama 2003). The current Global Education Industry (GEI) with its policy outsourcing, that are made for different conditions and driven by other motives and referred to as the hidden curricula (Mohammed & Morris 2019), is relevant to this concept as according to the managing director of the think-tank Korn Ferry (2019) sharing contexts and adopting to the local context is of importance to succeed and for this to happen knowledge sharing needs to take place in order to create new meaning. As western education models are being currently implemented in the UAE this is of relevance to this thesis.

In the UAE this might be incrementally problematic due to the fact that expatriates have short term contracts and are not included in the transition to a Knowledge economy. Furthermore the trust issue, that will be discussed at a later stage, which in Muslim-Arab countries is important (AlSarhi et al. 2014; Moten 2011), specifically for knowledge transfer to take place (Weir et al. 2005).

The combination of explicit knowledge to explicit knowledge is associated with exchange mechanisms in which individuals combine existing information they have in various ways, by telephone, documents or in meetings. The information gathered may then be examined and reconfigured or divided into categories; the creation of new explicit knowledge being referred to as the combination process by Nonaka (1994). When tacit knowledge is converted to explicit knowledge, a process of externalisation must occur, the individual possessing tacit knowledge must find a method of explaining it in a way that the receiver can comprehend.

This process can be achieved by means of metaphors, stories and graphics and, if facilitated by the recipients conversing with the possessor of tacit knowledge, better understand what is being transferred. Metaphor is useful in helping individuals to comprehend a concept by describing the features of a similar concept, and its success depends on the recipient using his/her imagination, being intuitive. The metaphor was also useful for helping an individual to relate concepts held in the memory from different past events.

The use of appropriate natural prototypes, which acted as stimuli for helping others to gather the maximum understanding for the minimum effort was suggested as a process by Rosch (1973). Therefore, deduction and induction are key skills which the recipient must use to understand the tacit knowledge being externalised (Nonaka 1994). Externalisation is particularly important because the conversations that the possessor of tacit knowledge has with the recipient(s), raise doubts and contradictions in their minds, and can create new learning. However, abduction or the employment of metaphor, analogy and model, and retroduction (Nonaka & Toyama 2003), were stated to be more effective than deduction and induction (Nonaka & Toyama 2003); retroduction refers to linking evidence with social theory, in other words combining induction and deduction (Saether 1999).

Once the knowledge has been externalised it can be internalised, a process that occurs by identifying the aspects of it that are relevant to the individual (Nonaka 1994). The knowledge acquired is then applied in practical situations and represents new routines; it is the outcome of organisational practices such as on the job training (Nonaka & Toyama 2003).

The implication of the lack of opportunity for 'ba' is that knowledge remains private and tacit, because its owner does not externalise it (Schon 1987); for instance as a consequence of a rigid organisational structure with no acceptance for failure or lack of motivation to learn, which might be associated with a strong company culture (Schein 1991). When an individual has no reason or willingness to express his/her knowledge to others, it is likely that s/he does not try to make sense of it on a personal basis. In such cases, organisational or individual, the same routines and mental models tend to be retained, as has been noticed in terms of educational models relevant to this thesis, for instance that western models are the one best method that has been adopted in the UAE not taking into account the hidden curricula.

Two modes of learning are suggested by Argyris and Schon (1978), single loop learning and double loop learning, also referred to as Model 1 and Model 2, respectively. Single loop learning is characterised by retaining the same routines without questioning them or taking the risk of doing so, because the mental effort and confusion associated with considering that another practice or belief might be more appropriate to a given situation is too great. Learning is defined by Argyris (1977) as

a process involving identifying mistaken or inaccurate ideas or practices and correcting them. In cases in which the error is retained, learning is prevented in both an individual or an organisational context, and results in the continuance of present practices or beliefs as the standard mode of achieving objectives; single loop learning is taking place. The single loop idea is described as being similar to an automatic reaction of how to respond to change, in an analogy to a thermostat that turns on and off when a room reaches a certain temperature, it takes the programmed corrective action (Argyris 1977). A useful example of single loop learning for this thesis is that some subjects become undiscussable, because the individual(s) resists talking about it to avoid the conflict that they expect to occur (Argyris & Schon 1987).

Real learning was associated with double loop learning, a learning model in which individuals critically appraise their assumptions about the world, for instance when a design fault is found in a product. Instead of just modifying the product and assuming that the error will be eliminated, the concept underpinning the product is appraised in terms of whether it is suitable for use or should be withdrawn (Argyris 1977). Double loop learning tends to occur, either because a sudden crisis impacts on the organisation or individual, an internal or external revolution occurs, or a crisis is deliberately created by the senior management of a firm to drive transformational change, according to Argyris (1977).

This learning model has practical application to the UAE context, since the overview of the UAE solution to accomplishing and developing a knowledge economy appears to have been approached from a perception that educational and political experts have the appropriate knowledge to alter the UAE educational policy, based on their previous knowledge, and by accessing expert external consultants. This has resulted in new educational policies and practices being devised to alter the previous model with an alternative that was designed for western developed country contexts and resembles single loop learning. This is further implied by the lack of involvement of those for whom the prescribed new skills are partially intended, the business community, and is rather similar to caution about discussing their ideas owing to the conflict that might be generated. Therefore, these concepts of learning are valuable to resolving the research question of this thesis.

The Johari Window is a personal learning model that helps individuals become more self-aware, and maps the pattern of their current learning behaviour, which then enables more open, two-way communication and information sharing in a transparent manner to generate productive learning, figure 6. This is of relevance for the lifelong learning needed in a knowledge economy. The students and people need to be aware of their learning as western, specifically British and American education models use classroom behaviour models with punishment and award systems which are the least self-motivating systems and efficient learning model. This is further discussed in the literature review.

It is useful in the individual context but could easily be applied to organisations (Hayes, Davies & Dick 1999), since its purpose is to identify how information is received and transmitted at four information levels, which relate to known and unknown information. An individual can map their knowledge sharing preferences by answering a series of standard questions and analysing the outcomes (Hill & Barron 1976).

Figure 6: The Johari Window

SELF

		Known	Unknown
O T H E R S	Known	I. Arena	II. Blindspot
	Unknown	III. Facade	IV. Unknown

Source: Little (2005)

Shared knowledge is defined as knowledge that is known by self and by others, and the larger this space is, the more open the individual or organisation is to transferring information and learning (Hill and Baron 1976). Individual well-being and mental health are associated with a large area 1, in other words moving information from

cells 2,3 and 4 into cell 1 (Hayes, Davies & Dick 1999). The blind spot area 2 indicates knowledge that the individual or organisation does not know but that others have knowledge of, and its size gives an indication of how much a person is willing to learn from others (Hill & Baron 1976). This could be linked to the hidden curricula in an imported education model. Area 3 is concerned with the extent to which the individual or organisation wishes to conceal information from others. In individual cases this might be information that will give him/her power over others or that its disclosure could harm them, for instance activities such as whistleblowing, manipulation or blackmail. The effect is to limit communication and therefore personal effectiveness (Hill & Baron 1976). In a knowledge economy, information sharing can be an issue as well as patents and therefore of relevance and linked to this window. In an organisational context what others know about an individual and are not prepared to disclose include collusion, co-dependency or conspiracy characterised by silence (Hayes, Davies & Dick 1999); its size demonstrates the extent of the dark side of the organisation (Hayes, Davies & Dick 1999). These are areas of self and organisational knowledge that are rarely addressed in management training programmes and hinder learning, including individual self-awareness, as the capacity to optimise it is limited. The significance of the size of Area 4, the unknown, knowledge that neither the individual or others have, is attributed to unconscious facts and feelings that may relate to an individual, and only revealed through psychotherapy. The extent of the unknown for an organisation is associated with its survival, such that employees must monitor changes in the environment and exchange information with other organisations and contacts (Hill and Baron 1976) which is crucial in a knowledge economy.

In relation to this research, the Johari Window suggests that, in order to optimise the quality of the educational policy and interventions to deliver appropriate skills and knowledge in the UAE, major influencing groups including business executives, government and government educational policy makers should rate themselves using a similar model, and employ the outcomes to determine what they need to do to increase transparency and learning regarding the other key stakeholders.

The concept of organisational knowledge is perceived more holistically by Argote and Ingram (2000), and relevant to this research in the context in which business leaders

are likely to consider knowledge. The perception of knowledge by business is potentially different to that of public sector officials and educational consultants (Argote & Ingram 2000). Three types of knowledge were proposed as characteristic of organisations, its human assets, its tools, including hardware and software, and its tasks, meaning its purpose intentions and goals; sub networks of knowledge were created by the merging of the three elements. The important examples of sub networks suggested by Argote and Ingram (2000) included social networks that emerged when human tasks were either combined or individuals alternated between different tasks, division of labour alluded to as a member-task network. Subnetworks contributed to organisational performance by the degree to which tasks are given to the most skilled in the division of labour, internal compatibility of human asset with task delegated.

This section of the thesis focused on the meaning of knowledge and knowledge transfer that is required to ensure that learners in an educational or training context obtain the skills and knowledge required to create a successful UAE knowledge economy. The intention to transfer knowledge was a major driver of knowledge transfer especially when concerned with tacit knowledge. However, studies have demonstrated that intention frequently does not result in the required action, for instance Azien (1991) found that attitude, subjective norms and the sense of being in control impacted on the potential for intention to be fulfilled. Even when sharing information was the custom, the degree of sharing was found to rely on trust, fairness, creativity and group cohesion as well as each individual's perception that s/he has resources that merit sharing (Chen 2011); poor self-esteem or negative consequences from knowledge sharing diminished the extent of practice (Schon 1987; Kuo & Young 2008). As indicated by the Johari window model, Riege (2007) stresses the power motivation that prevents fulfilling an intention to share being stifled but that other aspects such as language, poor technology skills and lack of shared vision, also contributed. The implication for this researcher is to enable contributors to this study to share knowledge and perceptions by creating an environment in which all contributions are considered valuable, and that they are gathered in a communication mode that generates confidence to express views, without the fair of failing.

2.3.4 The Knowledge Economy

Drucker (1969) coined the term knowledge worker and the knowledge based society is a term attributed to Bell (1976), who recognised that the global economy was moving from an industrialist to a post industrialist context, in which the major difference would be that innovation would no longer rely on invention that was random in nature, but from theoretical knowledge. The post-industrial society was expressed as an information society, such that the exchange of diverse forms of information would take place, for instance by means of market research, data processing and record keeping. Data transmission systems were perceived as being the economically based power sources in the information society analogous to oil, gas, coal and nuclear power, in the industrial society.

The knowledge-based society was described by Bell (1976) as dependent on relationships between various individuals and groups, person to person relationships rather than the industrial society's person to machine relationship. The increasing pace of personal interactions between individuals was forecast to be more characteristic of the information age than the rate technological advances; a revolution in telecommunications was predicted to allow real time exchange of information and financial transfer globally. Human capital was the strategic resource required by the knowledge economy, because it depended on theoretical knowledge production and distribution. However, the early identification of individuals with theoretical knowledge was not well understood but was necessary for increasing human capital. The inference was that education must be focused on identifying talent, enriching its education in terms of creativity and innovation, as well as developing opportunities for individuals to apply their skills and knowledge (Bell, 1976).

The change in the character of the required labour force in the knowledge society was emphasised by Bell (1974), who described the decline of low skills labour, referred to as the industrial working class, and the growing importance of a technical class. This change complemented theoretical knowledge as the core of the economy, and that technology had a different purpose and meaning, since it was associated with the creation of new industries and products. This change in the nature of employment is re-emphasised by Bell (1999, p.1) as a striking change in which an extraordinary

increase in the proportion of professional and technical employment had occurred, with the demise of skills and semi-skilled work.

The knowledge economy is further articulated in terms of other major features: education rather than family business or a traditional family occupation, as the means to social mobility; the expansion of professional and technical careers with entrepreneurship also requiring higher educational attainment; human rather than financial capital and, increasingly, social capital that had enabled access to social networks and opportunities; technology and, more importantly, intellectual technology derived from mathematics and linguistics, which applied algorithms related to decision rules, software based models and simulations; a communication based infrastructure replacing transportation as the main means of connectivity; value based on knowledge, leading to invention and innovation, higher return on investment owing to lower cost, and generation of labour saving devices.

Although this description of the knowledge economy mostly is derived from one source, the degree of detail that it provides, justifies its inclusion in this section in detail because it represents a substantial part of a framework for comprehending the complexity of the concept and the huge transformation that is required to move from an industrial economy to a knowledge based one; Bell (1999) is particularly useful because UAE remains reliant on industrial resources.

The Organisation for Economic Cooperation and Development (OECD) (1996) defines a knowledge economy as one in which knowledge is the source of productivity and growth, meaning that focus was needed on information, technology and learning. However, Brinkley (2006) suggested that neither the term knowledge economy nor knowledge worker was usually defined because the fundamental principles were difficult to express. Knowledge has always been a major feature of the economy, according to Brinkley (2006) so that the proposition that it is a new phenomenon is not entirely justified but demonstrates that its importance has increased substantially. In addition, Brinkley (2006) emphasises the intrinsic value of knowledge as a sustainable entity, because it is renewable, rather than being depleted by use; it is a valuable commodity to economies because they can share it with others. The prediction made by Brinkley (2006), was that 50% of GDP and employment

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would be generated by knowledge-based industries within a short time period. Those industries were characterised by employing the historically most highly educated workforce, indicating that future employees would require academic degrees or equivalent qualifications. However, few economies were found to have invested in knowledge enhancement in the previous ten years, Brinkley (2006) identified three tiers of knowledge investment activity: high investment countries investing 6% GDP, for instance United States and Japan; medium investment nations of northern Europe and Australia 3% to 4% GDP; low investment countries, such as southern European nations with 2% to 3% GDP. However, although investment in knowledge innovation alone was important, investment in physical infrastructure continued to be the priority for world economies.

In order to understand the importance of the knowledge economy and to measure its progress, the research by Brinkley (2006) proposed that the knowledge economy features were: present in all economic sectors not merely knowledge intensive sectors; generally operates to similar economic laws as past economies; involves high and increasing Information and Communication Technology (ICT) usage by a highly educated workforce; is associated with an increasing proportion of GDP devoted to intangibles compared with tangibles; comprises innovative organisations that employ new technologies to generate innovation related to processes and organisational presentation; knowledge economy organisations reshape work tasks by means of knowledge management tools, to access, share and store information.

An alternative method of classifying and understanding knowledge economy and enabling its measurement was by industry sector, the occupations of knowledge workers, and innovation. However, each of these had advantages and flaws, for instance the definition of the knowledge economy in terms of the knowledge worker was cross sectoral but there was no agreed definition of the knowledge worker and different international employment classifications exist.

The weakness of the classification of knowledge worker was also emphasised by the findings of Brinkley, Fauth et al. (2009), which found that employing job titles or education as a means of defining them was inadequate, because 20% of the working population employed in high knowledge content jobs were not graduates. The

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research also found that using sector categorisation revealed relatively equal numbers of jobs in high tech manufacturing as in high tech services, but interestingly knowledge workers tended to cluster in specific geographical locations, and this was considered logical as contact networks and associated relationships were important for information exchange, especially tacit knowledge.

In addition, the study revealed several features of the workplace, working hours and mismatch between skills required and available and the fit with organisational culture, which are useful to this research, when appraising skills for knowledge work. In terms of definition of the knowledge economy by sector, OECD (2005) proposes that finance, insurance, telecommunications, business services, education and health are highly knowledge intensive, whilst Brinkley (2006) includes the energy supply and retail sectors. A third alternative for classifying knowledge economy is to identify the major skills to optimise it (Brinkley 2006), and the study by Levy and Murnane (2004) recommended as a reliable source. This approach is explored in the UAE context in a later section of this Review.

The World Bank (WB 2018) proposes that the knowledge economy comprises four major elements: education and training to generate knowledgeable skilled professionals that are capable of creating, sharing and using knowledge; a dynamic digital information infrastructure for enabling the effective communication, analysis and processing of information; economic incentives and institutional support to allow free knowledge flow, to stimulate investment in ICT, and to encourage entrepreneurship; a network of research centres, including universities, private companies and community groups to gather global knowledge, assimilate it and adapt it to the local context and therefore to use it to create new knowledge. This concept of the knowledge economy is, therefore, more focused on the infrastructure that on skills sets, even though it acknowledges their contribution. Shami et al. (2016) highlights a platform of knowledge production where you manage, create, process and share. These studies present diverse methods of perceiving the knowledge society and measuring it and are useful to this research because they will enable a more holistic approach to be taken to its meaning, which should be considered when developing new educational policies, pedagogies and institutional objectives and goals.

2.3.5 Policy Making and Educational Policy

This part of the Literature Review focuses on educational policy and practices that have been developed and implemented as a means of creating and continuously extending the knowledge economy. It appraises the general concept of policy making and of the purpose and form of educational policy. The concept of policy making and the characteristics and motivations underpinning it are important to this research because they provide an understanding of how and why the UAE created new educational policy in a relative short time frame.

2.3.5.1 Policy and Policy Making

Public policy is described as "the combination of basic decisions, commitments, and actions made by those who hold or influence government positions of authority" by Gerston (2010, p. 10). As Colebatch (2009) explains; policy is firstly a `concept` or an idea that is used to make sense of the world. New policy is usually generated by groups demanding change, decision makers and those who will be most affected by any alteration to the status quo. In most cases a specific governmental department is delegated the authority to devise the policy, but initial intentions may be reshaped by the parties inside and external to the government. Therefore, society may benefit or be disadvantaged by governmental actions, although generally some sections of society benefit more than others, and some public policy decisions that relate to accomplishment of political goals tend to have higher societal impact. Two important linked aspects of public policy are that it is associated with the values proposed by politicians, which are more influenced by specific societal groups than those with less interest or power and has the purpose of determining the solution to problems and taking subsequent governmental actions (Gerston 2010).

Therefore, public policy creation is dynamic and subject to the conflicting opinions of societal groups, political institutions and external events, which invoke a response, particularly if inaction is perceived to eliminate the chance of profiting from a major opportunity. In other words, policies may be made hastily to exploit an opportunity, and the level of investment is allocated on the basis of its perceived importance. Another important characteristic of policy making, is to alter the values and norms of society, to mobilise social evolution (Gerston 2010). This is the context of this research.

The development of policy is perceived in four ways: as text, a set of regulations or expected requirements and behaviours, actions based on diverse values, as a process and as discursive referring to the merging of different cultural codes, for instance education, community, customs and practices (Jones 2015). Hence analysis of public policy cannot be equated to science because it is not based on rationality, but on subjective criteria and, therefore, analysed in relation to social science factors, for instance, the needs emotions and forecasting efforts of various parties (Gerston 2010). Therefore, policy can be perceived as analysis according to philosophical reference points, as suggested by Dixon and Dogan (2004). The outcomes of the analysis depend on the epistemological and ontological positions taken by the analyst and, at the extremes, these are the objective or scientific like approach or the subjective approach, although any combination of the two extremes in range of proportions is also possible (Collis & Hussey 2014).

The philosophical framework devised by Dixon and Dogan (2003) for analysis of policies demonstrates that perspective varies and that observers fail to agree on the meanings because they have incompatible understanding of what comprises a fact in the social sense. Hence cause and effect relationships cannot be identified and agreed descriptions of human nature fail to materialise (Dixon & Dogan 2004).

The diverse concepts include many features that are relevant to Emiratis in the UAE, because they represent a minority in the population living and working in the country, have historically chosen the public sector rather than the private sector of the labour market, and have received substantial benefits from Government in the past owing to the oil wealth (GOVae 2018a). The focus of this thesis is the evaluation of UAE educational policy in relation to the Emirati population, therefore the study by Dixon and Dogan (2003) provides a vital framework for understanding how educational policy evolved in the UAE.

Policy is analysed in the context of exploring and understanding specific conflicting and irreconcilable perspectives on social reality; the analysis is therefore expected to generate different opinions on the problem to be resolved, and how it should be settled. The extremes of philosophical approach, the objective and the subjective, which Dixon and Dogan (2004) refer to as the naturalistic and the hermeneutic, are aligned with perceptions of the nature of acceptable knowledge and of reality, in other

words epistemology and ontology respectively. These relationships are diagrammatically represented by table 3.

Table 3: Four Philosophical Approaches to Phenomena

		EPISTEMOLOGY	
		Naturalist	Hermeneutics
ONTOLOGY	Structuralist (Externa/Independent)	Naturalist Structuralism	Hermeneutic Structuralism
	Agency (internal)	Naturalist Agency	Hermeneutic Agency

Source: Author adaptation of   and Dogan (2004, p. 564)

The Naturalist epistemology essentially refers to an objective stance to knowledge, and hermeneutics is concerned with interpretation and is subjective. Naturalist structuralism assumes an objective social world, acceptable knowledge resulting from scientific investigation and social structure controlling agency effects, whereas natural agency proposes that individuals are responsible for their actions and predictable owing to self-interest which is not restrained. Hermeneutic structuralism considers that knowledge derives from individual action is made knowable as it is being constructed by collective interpretation of what was observed, and hermeneutic agency suggests that human knowledge is based on individual beliefs that are bounded by subjective interpretation of social reality and unpredictable.

As Dixon and Dogan (2004) suggest, educational policies leading to development of educational models developed for western developed countries, based on western perspectives of epistemology and ontology, are likely to differ substantially from those appropriate to non-western countries and emerging economies. This difference infers that this will be the case for UAE, such that human nature, ethics, values, interpretation of valid information, decision making processes, power, compliance and/or conception of risk may be founded on difference assumptions. This is an important consideration for this research question, when analysing and evaluating the relative appropriateness and success of UAE education policies and practices, which have been determined by academic studies as mostly western models and are

considered in the last sections of this Review. These assumptions are considered in some detail in the context of their impact on policy, specifically education policy.

The naturalistic epistemology is characterised by synthetic or analytic statements: synthetic statements are derived from empirical testing that provides knowledge gained by observation or testing and based on logic; the analytic is not founded on empirically derived knowledge but on deductive logic, which implies logical truth although empirically this may not be the case. In this perspective reality is independent of the phenomenon studied and the policy analyst could have no impact on the findings of his/her analysis. Knowledge is accepted on the basis that it aligns with a single established truth, meaning it is tested or observed against the established theory, and then verified or rejected (Dixon & Dogan 2004).

The hermeneutic approach proposes that knowledge is created by humans, owing to their interpretation of phenomenon, which is reliant on their values and experience, ideations, and therefore knowledge can be derived from many sources. The inference for this thesis and for policy making, is that reasoning and values such as morality vary considerable across cultures, owing to different beliefs and belief systems. Hermeneutic knowledge is specific to cultures and changes with time and examples include: existentialism with individuals searching for self-fulfilment; phenomenology related to how individuals identify distinct, meaningful experiences; linguistic epistemology allied with learning the rules of a language and therefore acquiring knowledge shared by doing so (Dixon & Dogan 2004).

The parallel ontological stances are structuralism and agency: structuralism in which the individual is separate from social structures, which determine social action and restrict its thought and action patterns. Many forms of structuralism have been identified for instance: symbolic structuralism in which individuals make sense of what is being communicated by means of language, identity and society, and shape interactions such as negotiation; postmodern structuralism that assigns only temporary meaning to the social world, owing to concepts of truth and reason having dynamic meaning. Agency suggests that all social action is intentional, social agents act voluntarily and according to their mental state at the time. Therefore, in order to act, the individual has to believe that a change is required, actions that could be taken to generate the change with the belief that it can be accomplished. Rational choice

theory and game theory are amongst those associated with agency; rational choice based on the actions of individuals as motivated by self-interest and game theory associated with making decisions in time of uncertainty (Dixon & Dogan 2004).

Therefore, the four distinct approaches policy analysis, as summarised in table 4, allowing the researcher and the reader the means to quickly assess the type of approach that may be the foundation of a particular pol.

Table 4: Summary of Four Philosophical Methodologies

Source: Author form Dixon and Dogan (2001)

These four approaches to policy analysis were applied by Dixon and Dogan (2003),

		Epistemology (Knowledge)	
		Naturalism – one form of reality	Hermeneutics- many forms of reality
Ontology (Reality)	Structuralism (External/ Independent)	**Naturalistic Structuralism** The social world is objective, knowledge is obtained by scientific-like methods and human behaviour predictable. The state of human behaviour accomplished by social structures limiting power over agency. Comprises various types of structuralism	**Hermeneutic Structuralism** The social world is socially constructed such the individuals act according to their collective perception of reality.
	Agency (Internal)	**Naturalistic Agency** The social world is objective, knowledge is obtained by scientific-like methods and human behaviour is constrained by their high levels of self-interest and can therefore be predicted. Associated theories include rational choice and game theories.	**Hermeneutic Agency** The social world is socially constructed based on individual values and beliefs and hence behaviour is unpredictable

by having identified the characteristics of each in respect to ethics and morality, human nature, justified knowledge, rationality mode, power and compliance and significant analytical risks.

The Naturalist Agency perspective suggests that the social world is knowable and objective and comprised a group of individuals that interact with each other, employ their own choice freely and develop contractual relationships. Individuals are expected to manage their undertakings in an environment in which there is no compulsion to adopt a specific stance and they are responsible for their own action only. The judgement of whether a potential action is correct is based on how it aligns with moral facts or rules for moral action. Hence policy makers adopting this stance tend to judge the actions of others based on the value of their actual or intended impact, for instance producing the optimum outcome for a societal group; a rational approach implemented to achieve a specific purpose.

The main limitations of this policy analysis approach are that explanations for why the incentives to conform with it do not work are not objective. The intended effect of the incentive measure is not being realised, the objective cause and effect link is not

found. This is a consequence of failure to understand that ideology or religion may hinder willingness to conform.

Therefore, the nature of social justice, for example to include people with special needs, or groups who need economical support is determined by naturalist agency policy makers according to measurable criteria, for instance skill or income levels, restricted education, poor employment record and health problems. Therefore, the social justice issue represents a problem that can be resolved by ceasing or reducing social support available, for instance income support, which on the other hand might diminish motivation to find work. Currently in the UAE specific programmes are made available to obtain work, education and be self-dependent. Shore et al. (2011) highlights that until now research has focused on group diversity and multiculturalism but since recently scholars focus on inclusion of all individuals and social justice for all. This concept of social justice and inclusion is interesting and wholly applicable to this research because it infers that economic and social justice are considered to be integrated rather than separated. Therefore, social justice could be integrated into the education policy to deliver UAE economic growth in which Emiratis fully participate; the inference is that social justice and social responsibility are important concepts. There are various Islamic principles however social justice is one that is considered the same for all humankind and involves among others peace, love and prosperity. Three elements are specifically mentioned: "equitable distribution of wealth, provision of social security and protection of the weak against the strong" (Chaudry 1988, p.9). This concept can be argued to be universal.

This type of policy analysis and perception is likely to be one of the options, which has influenced the UAE Government, given that until recently Emiratis received substantial social benefits as a consequence of the buoyant oil and gas market (Saadi 2017). The new economic goal of ensuring that Emiratis take a full part in developing and maintaining the Knowledge Economy is partly a reaction to measuring the potential long-term impact of an unsustainable economy (Executive Council 2007). Therefore, Emiratis are provided with alternatives to dependence on State benefits by access to education and training for private company employment. Also, the NSM for P-12 in government schools in the Emirate of Abu Dhabi is an inclusive model and the believe behind it is, that all children can learn (ADEC 2010).

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In the Naturalist Structural perspective, the social world is also perceived as a knowable reality in an objective sense, but based on an hierarchical social strata, such that each individual understands his/her position in the social hierarchy and, therefore, that others determine the reasoning s/he applies to own matters. This infers that morality is associated with trustworthy persons in authority, and that duty and obligation motivate action. Hence human behaviours can be shaped by these moral beliefs. Decision making is based on bounded rationality, which is restricted by personal values sets including those that derive from the accepted social order.

As a consequence of these beliefs, social justice is defined as comprising those individuals who have lost their social identity because they no longer accept or fulfil their social obligations; the individuals belonging to this group can also be determined by measurement of compliance with social order. This means that policies are made to ensure that social order is restored and that all individuals comply with it by means of new regulations or increased police activity; unpredictable, undesirable behaviour is stemmed (Dixon & Dogan, 2003).

The major risk to the policy analyst with this perspective is that s/he is unable to either understand the problem or devise the solution if objective methods cannot be employed to do so. Therefore, the solutions prescribed do not have the intended outcomes because of non-conformance by individuals, who are motivated by free thinking and are not bound by any sense of obligation.

In the context of this research, this type of policy approach could be taken, for instance by means of imposing more compulsory schooling complemented by testing, to ensure that the requisite qualifications are obtained, as well as introducing extra pathways, such as Foundation Year to enhance English skills for university entrance, which individuals must follow to be able to fulfil the social obligations (BC 2018) as is one of the goals for Emiratis in the knowledge economy.

The Hermeneutic Agency perspective to policy analysis does not view the social world as an objective reality, so that individual does not act in a predictable manner and therefore attempting to change the social world is relatively futile. This is a consequence of the uniqueness of each individual's set of beliefs and values based on specific experience, and consequently on how s/he perceives the world. Therefore, each individual strives to find his/her own position and identity in the social world

and has to speculate when reasoning. In this stance moral judgement and rules are not valued, instead personal reasoning and intuition are the basis of ethics and morality. The individual chooses whether to take responsibility for his/her ethical stance or not and others cannot impose moral standards on them. Hence the individual chooses on what basis s/he wishes to live and does not consider any knowledge as the truth. The consequence of this perspective on policy making is that it is precarious, because there are no identifiable norms owing to the unpredictable nature of human beings. Sense making is based on examining issues in hindsight, so that solutions to issues must remain open to enable new opportunities to influence them.

The policy analyst adopting this perspective does not give credence to the existence of any objective reality, so that unpredictability regarding social action is over-estimated especially as individuals have some expectation of reciprocity relating to a specific action, and hence some measure of objectivity in their behaviours.

In this policy analysis mode, individuals perceive themselves in need of social justice by identifying what they consider the term means, such that they do not consider their lives satisfying. Therefore, policies are based on the idea of helping individuals to attain a more fulfilling, authentic life by assisting them to construct ways to decide their future and to optimise their potential. This objective is achieved by enabling individuals to contribute to public policy making that support their particular perspective of the social world.

In the Hermeneutic Structuralist perspective, the social world is considered to be a knowable, socially constructed reality, therefore it has a subjective nature and groups with collective interest exist, which agree and are committed to their concept of social order. Morality and ethics are based on social norms and on shared experience, and therefore represent the agreed rules for actions and behaviours. Individuals have responsibility for acting with good intentions and associated emotions, so that human qualities relating to honourable behaviour towards others are expected. The individuals are part of a community that prefers social order and aims for civil order, justice, equality and fairness, and since reality is socially constructed, the perception of what is acceptable can be varied by means of new information and perception. Therefore, the individual's development and values are dependent on who s/he knows,

and knowledge is obtained as a result of discussion and argument that results in mutual understanding of an issue.

The inference of this stance is that knowledge is never perfect but is always subject to improvement, and rationality on developing consensus by means of communication, discussion and conflict regarding potential positive or negative impacts. Decisions are therefore made collectively and limited by the information that the social group possesses, and therefore voluntary complaints with decisions are expected. The major analytical risks in this methodology are that policies are dynamic, constantly subject to revision, and that the required conformity with policy depends on agreement of the individuals in society, who have specified collective norms.

This group defines social justice as associated with individuals who do not conform with majority of society, are excluded from society because their preference is for a different type of life than the norm, and this preference disadvantages them. Therefore, policy is directed at ways of persuasion to accept the societal norms and represented policies to include them. Therefore, policy programmes are focused on attempting to socially engage the individuals enabling them to grow and develop so that they can be socially included (Dixon & Dogan 2003).

Business leaders and Educational leaders and government might have various perspectives on the role of education and needed skills set in UAE's knowledge economy which makes educational policy making a complex problem. Adding that the educational policies, which are currently based on implementing predominantly western societal norms regarding education and employment (Hills & Atkins 2013), on which Emiratis might have a different perspective on.

2.3.5.2 Educational Policy

Policy making is characterised by four dimensions, the synoptic and incremental modes and the societal personalistic and organisational bureaucratic mode, figure 7.

Figure 7: Four Modes of Policy Making

Synoptic mode

Incremental mode
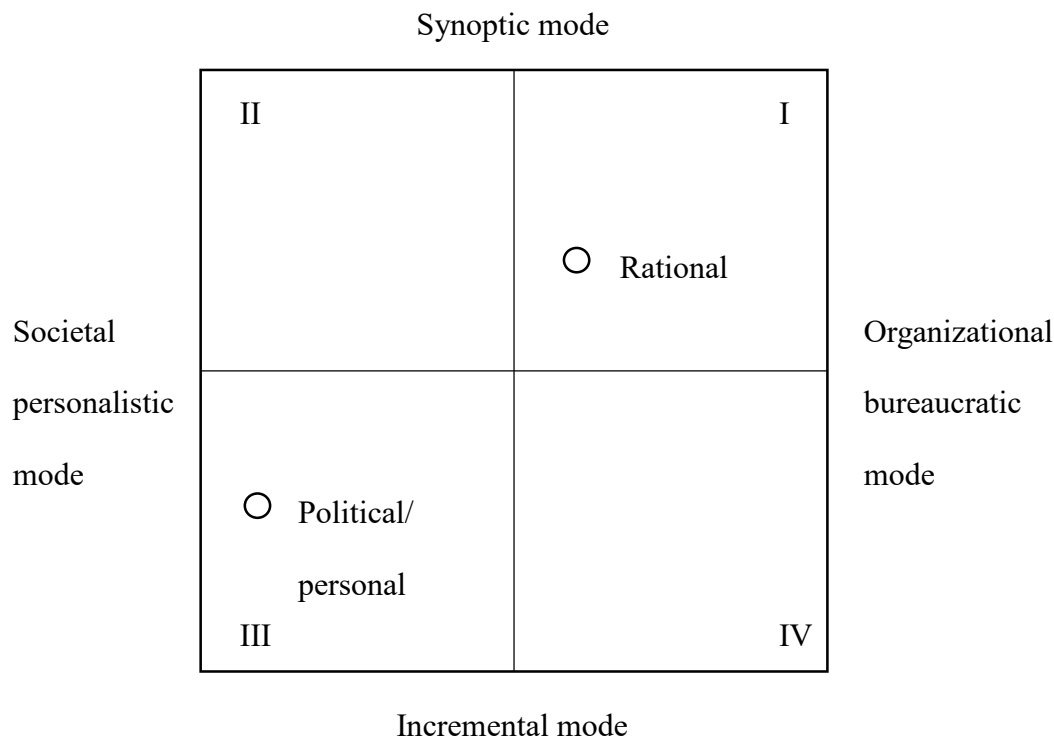
The synoptic approach is that a single central planning authority devises policy for the whole of society and integrates economic, social and political controls. This model assumes that there are agreed criteria on which solutions can be appraised, the challenge is resolvable with human cognitive capacity and problem solvers are incentivised sufficiently so that they complete the task.

In contrast the incremental policy making model is dependent on interaction between different groups. Its assumptions are than policy options are typically framed by uncertainty and made in the context of dynamic conditions, there is no definitive correct solution, such that no large scale reforms should be made, instead small changes should occur and are those that redress dissatisfaction expressed with previous policies or to eliminate a problem urgently. Hence some policy changes are merely temporary. The societal personalised model is shaped by government politics,

which integrates the opinions of individuals, whereas the organisational bureaucratic model, in which organisations that have relatively weak ties, contributes to policy making which is partly coordinated by government leaders (Haddad 1995).

Hence the actors in decision making, represented by the horizontal axis can be any combination of individuals and organisations or the extremes or one type only. The type of policy making on vertical axis can similarly vary from purely rational to that bounded by uncertainty and incremental approach. Each quadrant, therefore, suggests an approach based on the dominant players and their perspectives (Haddad 1995); this model somewhat resembles Dixon and Dogan (2003). In quadrant 1, decision making is rational, controlled centrally, and technical, and it aims to maximise value, whereas quadrant lll integrates the self-interest based political activity, typified by political bargaining, diverse forms of rationality and associated values. In most cases, Haddad (1995) suggests that policy making is a balance of these two approaches, that this balance is appropriate for education and that research focusing on educational policy making stresses that it is a complex, multifaceted process because of the need for educational change over time, and the nature of the current and future educational systems. Therefore, in this section of the thesis, the type of educational policies that are emphasised as necessary to foster the knowledge economy, would be expected to have these features.

 A similar concept is presented by Jones (2015), who proposes that formal educational policy is generally developed by governments, and considers the values expressed by stakeholders such as individual, communities, institutions and others. In the context of this thesis the wider range of stakeholders that Jones (2015) refers to would include business leaders and the skills gap in the current job market. However, Jones (2015) also stresses that governmental policies can be interpreted in various ways by school leaders, teachers, parents, the community and students, so that the outcomes from the policy are not those that were intended. This is an important observation, that must be applied to the analysis of education policy and its pedagogic interpretation in UAE, in a later section of this Chapter.

2.3.5.3 Policy Making for the Knowledge Economy

An OECD (1996) report suggested that Governments would need to develop policies to increase human capital, which should be achieved by means of promoting specific

skill sets, particularly learning capacity, generating knowledge distribution and diffusion of emerging technologies. This could be achieved by promoting the economic value of collaborative networks, and subsequently enabling organisational change that would maximise productivity by the optimum employment of technology. The report suggested that the OECD needed to develop policies directly related to the knowledge economies, in science, technology and industry to maximise outcomes, including wellbeing; it emphasises the importance of knowledge and technology in stimulating high growth and productivity (OECD 1996). Furthermore OECD (2000) highlights the importance of a whole learning society where education not only includes formal learning but extends to learning centres as Spring (2000) calls world education culture.

The implication for nations such as UAE is that similar policies should be devised. In relation to formal educational policy, OECD (1996, p.7) firstly targets tertiary education and beyond, focusing on what it refers to as the science system, comprising public research laboratories and higher education stating that it should be generating production of knowledge by means of "basic research and the education of a new generation of scientists and engineers and collaborating with industry in the transfer of knowledge and technology." The close involvement of academic institutions with industrial partners as a means to innovation is also emphasised.

The relevance of this statement to this research is that industry should logically be one of the groups shaping educational policy since its leaders will have specific ideas on what skills and knowledge is required, both from a scientific and a workplace soft skills perspective. This statement is important to confirm that the rationale for this thesis is sound, particularly as the evidence presented later in this Literature Review reveals the inadequacy of current UAE education policies to accomplish these aims.

The capacity to accumulate tacit knowledge, by learning in formal and informal ways supported by information technologies, is stressed by OECD (1996), that it will be acquired by formal education, and being capable of applying theoretical knowledge to practical situations. Education was inferred as the means to learning by doing, learning in a non-formal manner, but with formal aspects incorporated, and therefore preparing students for knowledge-based work. This type of education also related to workplace learning in which the organisation and its management needed to

constantly adapt skills to exploit new technologies and to develop networks so that they could participate in interactive learning by knowledge exchange with partners and end users.

Appropriate government policies for education, science, technology and industry were recommended by OECD (1996), and acknowledgement of the central role of the firm was required to promote and, therefore, to enhance broad access to skills, competences and learning capabilities. The shape of formal education was characterised by broad access to skills and knowledge. However, whilst higher education policies in many countries encouraged a higher proportion of the population to obtain graduate and post graduate qualifications, there were tensions between quality of the educational outcomes and the number of students enrolled in higher education, which is potential damaging to producing high quality research and research training owing to financial limitations.

Higher education policies could be framed to ensure that important research roles were available for students, especially as even at the early stages of the knowledge economy, the knowledge industries comprising education, computers and information services and communication media had generated 30% of Gross National Product (GNP) in the United States (OECD 1996).

Measuring a nation's human capital in terms of years in formal education was no longer relevant, because it bore no relation to the quality or to the potential economic return to the national investment made in formal education (Resnick, 2002). In addition, such measurements of human capital omit the vital non formal learning occurring in workplaces by tacit knowledge transfer activities, such as on-the-job training; new human capital indicators were required, such as social rates of return which seek to determine the impact of educational investment and human learning achievements on economic growth (OECD 1996). The educational reform required for a knowledge economy has been based on incremental rather than transformational change in most countries, according to Resnick (2002). Therefore, testing educational outcomes and assessment may have altered by means of the existing curricula, but Resnick (2002) stated that pedagogies had changed too little to optimise outcomes that support a knowledge economy.

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From this researcher's perspective, the OECD (1996) focus and that of other academic papers (Peters 2003a) is illogically directed solely to higher education and industry and neglects that important fact that vital attitudes and approaches to learning must be developed from the earliest life stages. It is much more difficult to change mindsets at tertiary level, the learning methodologies and attitudes to learning begin to develop from pre-primary level schooling (FTF 2017).

The report on Early Childhood Education by UNESCO (2007, p.12) further stresses the importance of education to the development of a child's fundamental values, behaviours, attitudes, skills and habits, and that what is learnt at this stage may have a long-lasting effect. A child becomes aware of stereotyping, wealth and inequality at an early stage, such that education which supports sustainable development in terms of democracy, cultural diversity, gender equality and careful use of resources, instils the associated intellectual, psychological, emotional, social and physical basis for full current and future participation in society, education and a knowledge based economy. In order to achieve this young children's understanding of phenomenon should be listed to and considered by the educator, encouraging intellectual dialogue and discussion. Early education should therefore also focus on the 7Rs, namely: reduce, reuse, recycle, respect, repair and reflect to encourage science and technology awareness and literacy. In terms of diversity, globalisation had altered societies to ones in which different cultures were in close contact, so the early years education should embrace acquiring a sense of their own culture as a global citizen and appreciation of other cultures (UNESCO 2007). The report strongly recommends high investment in early years education to develop appropriate learning skills in the science, technology and citizenship areas.

Guidance on Early Years Education was provided by the British Association for Early Childhood Education (BAECE 2012), which includes traditional reading, writing and arithmetic as well as science, technology and health and self-care; all in the context of building communication and language skills, listening and paying attention to other views. The health and self-care approach are an important aspect in the rapidly changing world, which the young child will increasingly experience as s/he develops.

Amongst the concepts are to encourage the child to tell an adult when s/he is tired and observe the effect of activity on his/her body so that s/he opens dialogue that initiates

responses regarding the need to rest when tired and to provide a special cosy place reserved for relaxation.

The importance of teaching lifestyle skills is also emphasised by Pincus and Freidman (2004), whose research demonstrated that children confront stress from an early age, for instance interpersonal conflict, and that their capacity to resolve it impacts considerably on their psychological health. Children can learn ways to cope with the negative effects of stress during early childhood as a problem solving, critical skills for healthy living, which also include emotionally generated stress. These two types of stress required different coping strategies, which can be incorporated into the educational environment and have proven to strengthen children's understanding and resolution of stress. Practical aspects of classroom management can reduce negative effects of stress, teach children solutions including how to cope with damaging interpersonal conflict emotional stress (Ephgrave, 2018).

Therefore, this thesis considers the educational policies and their outcomes at all levels of formal education in the UAE. This approach is also somewhat reinforced by a more recent OECD (2008) report that acknowledges that concept of lifelong learning required for the knowledge economy must be introduced at early school level, instead of current mindset of education being complete after the formal process ends. The Programme for International Student Assessment (PISA) system assesses educational attainment at age fifteen years in global nations and is conducted by OECD; it focuses on science, mathematics and reading (OECD 2018a). In OECD (2008), a comment was made that school systems were generally inadequate in developing the skills and capabilities required for lifelong learning and, therefore, for a continuously changing global environment. Using behaviour management tools in the classrooms based on rewards and punishments will not foster lifelong learning. It will foster a bullying behaviour as the teacher shows that labelling and public shaming is appropriate behaviours to solve a dispute or get rid of an unwanted behaviour. Furthermore, it will not encourage students to dare to fail, which is necessary in order for the students to be creative and innovative (Brown 2015).

PISA concentrates on scientific and mathematical literacy, understanding concepts, and capacity to adapt to different contexts in each of the three subject areas, rather than gathering and retaining specific knowledge (OECD 2008). Hence this report is

important generally, and to this thesis, because it stresses the requirement for knowledge economy skill development to commence from entry to the formal school system. From this perspective educational policy making must begin from the first entry into the education system, which in many countries is pre-primary level.

Despite the abundance of published literature on skills needed for knowledge economy and economic growth, the constant feedback from business leaders is that the current education systems in United States and the United Kingdom, for example, do not equip young people for the workplace. This fact is emphasised by Reigeluth and Karnopp (2014, p. 3), who state that students are being taught skills that prepare them for outdated business needs leading to complaints from business enterprises: "I`m very concerned about our schools. I own a small pharmaceutical business and the young people I hire tend to lack initiative and work ethic. I`m also disappointed in these employees` low ability to solve problems and work on teams. I have tried to address these problems with our school superintendent, but I can't get anything to change". Furthermore Mohammed and Morris (2019) highlights that the OECD has developed the 'PISA for Development' as a new way to measure quality of schools in various countries as Morgan and Ibrahim (2019) explains that the current PISA tests are made for students from certain context, mostly monocultural users and that this does not fit all countries. They continue that the above and the cross-cultural context would be a reason not to rely on these measurements in the UAE.

In the United States, a cultural perspective, the myth of the successful self-made business owner prevails and devalues the importance of education (Molnar 2006 but a contrary argument is made by Playfoot and Hall (2009) that business leaders would collaborate in the formation of educational policy if they were able to and identify themselves as being part of a wider solution.

A fundamental aspect of developing educational policy for the knowledge economy is defining the skills set that is required and therefore for this thesis. The concept of education was appraised by Playfoot and Hall (2009) as comprising suitable skills, knowledge and behaviours so that productive employment could be obtained. The implication of research by Dweck, Walton and Cohen (2014) is that non cognitive behaviours must also be considered in defining the skills set, psychological, motivational factors such as attitude to school, which is often influenced by ethnic

group or income, habits such as self-control and self confidence that help individuals to adjust their approach to learning and to adopt a stance that learning is a lifelong practice.

This type of non-cognitive behaviour is referred to as academic tenacity, which is an interesting concept for this research, since Emiratis represent a minority group in terms of total UAE population, and have diverse cultural norms from the majority; it is possibly a concept that has not been considered in current educational policies. The characteristics of academic tenacity include being able to focus on long term and/or higher order goals than merely short-term achievements; perseverance when difficulties arise in achieving goals (Dweck, Walton & Cohen 2014). Amongst the initial challenges are appearing to lack intelligence or feeling excluded, so that a feeling of belonging academically and socially is a basic aspect of academic tenacity (Dweck Walton & Cohen 2014) adding to that a culture of acceptance of failure is needed in order to foster lifelong learning (Brown 2015).

The school is a community engaged in learning, which is the key priority, and encourages attempts by individuals to make efforts to learn and apply more difficult concepts than they feel capable of doing easily; the individual looks for challenging tasks. A challenge is perceived as learning opportunity rather than a humiliating failure, according to Dweck, Walton and Cohen (2014), and also related to being able to remain engaged with learning over the long term, by finding strategies to enable continued motivation to learn. This life-long learning will not be fostered by using classroom behaviour management systems with awards and punishments (Lipnevish et al. 2016). With these classroom systems the student "needs not to have any motivation in a behaviour but to the reception of an award or the avoidance of a punishment" and it is considered the least self-determined form of motivation Lipnevish et al. (2016, p. 254) highlights in their research Psychosocial Skills and School Systems in the 21st Century.

In the 21st century, educational policy has increasingly been implemented by private organisations, particularly at higher education level, but also at primary and secondary level. Many schools are run and managed by commercial education companies, or large organisations, which are responsible for funding them, rather than by local authorities, which reported to central government department, as exemplified by the

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Academies programme in the UK. In contrast, the traditional school system was characterised by the State providing funding, regulation and directing the curriculum in many countries (Mansell 2017). For example, in Sweden as the public-school system was privatised the results went down dramatically in PISA.

Governments globally have been focused on tertiary level education policy, also referred to as higher education, and with the motivation that economic growth and global competitiveness are dependent on optimum knowledge and use of emerging technologies, and new methods of transforming inputs into outputs in the product and service context. In order to appropriately exploit this opportunity, there is a perceived need for universities to collaborate with private sector businesses in developing enterprise partnerships, which will maximise innovation possibilities. This means that higher education is considered to be a vital component of the knowledge economy (Peters 2003a) and that policies have been shaped to recognise the higher level of entrepreneurial skills that can be developed by individuals, who participate in higher education. This educational approach implied non traditional knowledge production, for instance developing scientists being combined with industry collaboration to enable knowledge and technology sharing (Peters 2003a). Therefore, policy initiatives generally include new performance measurements that have the purpose of enhancing economic output and achievement of organisational and government targets (Olsen & Peters 2005).

Still as highlighted above education doesn't need to go from traditional social institutions to becoming a degree mill (Gumport 2014), as non-routine manual tasks skills are still needed (Levy and Murnane 2013). However, the triple helix needs to work with "the interconnectivity of multiple problems, and subscribe to a participatory leadership style, which incorporates the idea of shared responsibility and problem solving" (Jones & Brazdau 2015, p. 251).

2.3.5.4 Pedagogy for the Knowledge Economy

Educational policies for the knowledge economy, are generally concerned with educational reform, which comprises rethinking what and how individuals learn. The typical school classroom requires fundamental change from teacher to student led, in other words, central control of all activities by the teacher, usually in the form of instruction and provision of limited information is no longer appropriate, according to

Resnick (2002). The major differences in approach were summarised by World Bank (2003), summarised in table 5.

Table 5: Comparison of Traditional and Lifelong Learning Models

Traditional Learning Model	Lifelong Learning Model
The teacher is the source of knowledge	Educators are guides to sources of knowledge
Learners receive knowledge from the teacher	People learn by doing
Learners work alone	People learn in groups and from each other
Tests are given so that progress to the next stage does not occur until students have completely mastered a set of skills and to limit access to further learning	Assessment is used to guide learning strategies and to identify pathways for future learning
All learners undertake the same task	Educators develop individualised learning plans
Teacher receive initial training and ad hoc in-service training	Educators are lifelong learners- initial training and ongoing professional development are linked
Good learners are identified and permitted to continue their educations	People has access to learning opportunities throughout their lifetime

Source: Author adaptation of World Bank (2003, p. 29)

An additional major change proposed by Resnick (2002) was that subject matter should be delivered in themes, in which key subjects are combined, and that activities should involve project work, and enable students to learn more independently and to make connections between knowledge in different disciplines such as science, mathematics and social sciences. This approach also changes the form of the school day from subject lessons to a focused, longer period on a specific issue that must be investigated, and with the teacher providing support and guidance, rather than instruction. In some cases, students of different ages might participate to stimulate their learning.

The curriculum subject matter has not altered substantially from the age of pen and paper to the digital age, according to Resnick (2002) but digital technologies could enable learners to extend their knowledge from what the curriculum comprises. The technology also allowed new experiences, for instance the exploration of how systems work; by means of computer simulation; exploiting types of learning that were not possible in the past. Ideas that were previously introduced at tertiary level can therefore be integrated into the school curriculum at a much earlier stage. Hence students are able to both learn certain theories and concepts but develop them further, in terms of devising strategies to discover what they do not know (Resnick 2002).

These ideas are useful when appraising the current UAE pedagogy because they are relevant to every level of formal education, not merely focused on the tertiary stage.

The OECD (2008) report on learning in the 21st century expressly states that pedagogy must be shaped to enable individuals to understand complex ideas and to use that knowledge to generate new ideas, theories, products and knowledge. It must also develop the student's capacity to critically evaluate what they read, to communicate effectively verbally and non-verbally and to understand scientific and mathematical approaches to problem solving; integrated knowledge, rather than knowledge separated into various compartments. A fundamental skill that must develop is to manage own learning and, in the context, that learning is continuous throughout life as stressed throughout this Chapter.

The importance of digital technology capacity by teachers, who are responsible for developing students' skills in the context of knowledge economy educational policy, is a vital aspect of pedagogy. The transformation of the focus of education from what the pupil knows to what s/he knows about accessing, managing, evaluating information and data is fundamental to 21st Century learning, and stressed by OECD in a guide for teachers developed by Intel (2014). Education must be shaped on the basis that the internet knows everything, and the world economy now pays individuals on the basis of what they do with the information they know (Intel, 2014).

Therefore, teachers must be trained how to use digital content and resources to help students to acquire skills and attitudes appropriate for the knowledge economy, including cultural understanding, teamwork and critical thinking, and to consider and critically assess the ideas and opinions of others. Professional development and formal performance assessment are therefore a critical part of educational reform (Intel, 2014), in order to measure the extent to which classroom teaching methods are driving changes in student attitudes to learning, and in the type of skills and the associated competence levels.

However, the reforms and related pedagogies must also take a continuous learning approach, in order to complement the constant changes in the global environment; students must also understand that the world is evolving as a consequence of digital technologies. The capacity for teachers to empower individualised student learning, rather than direct a certain approach or content, is totally possible in the digital

platform context (Intel 2014) and operationalises Resnick's (2002) concept of the contemporary classroom.

2.3.5.5 Educational Policy Model for the Knowledge Economy

The purpose of this section is to outline the types of policy and reforms that have taken place in selected countries, which are reported to most successful in developing knowledge economy skills. Hence, it provides a means of comparison with the situation in the UAE, which is appraised in the last part of this Literature Review.

In a general sense, Peters (2003) proposes that education is fundamental to the successful transition of any nation to a knowledge economy and this infers the accomplishment of several objectives, for example knowledge culture and knowledge capitalism.

The first objective is gaining an understanding of knowledge cultures in relation to regional capitalist models, where knowledge culture relates to the cultural preconditions that must be established before knowledge based economies or societies can be established; knowledge cultures relate to cultural preferences developed over long periods of time in the way activities are conducted. Knowledge capitalism infers that knowledge is a global capital resource and has become perceived as one of the most valuable, characterised by five diverse regional models of innovation, ownership and production generated as a consequence of cultural beliefs about knowledge and learning and its value. Therefore, regional knowledge capitalism should impact on educational policies in different parts of the world so that an index for regional differences is possible; Peters (2003b), emphasises the acknowledged existence of five examples: Anglo American, Japanese. European social market, French State and Chinese market socialism.

Networking between universities, the Government and businesses, and economic awareness and its influence on policy, represent a second objective. New knowledge technologies enabling uncontrolled access to diverse worlds and of pedagogical value, must be employed, but with the ethical and critical capacity to evaluate the differences. In addition, access to new technologies should be assured for all, rather than creating inequalities, as frequently occurs. Creation of, and emphasis on, trust is frequently a cultural condition, but also on mutual rights and responsibilities that

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diverse knowledge partners and institutions agree, so that knowledge transfer is enabled, and a learning culture inculcated (Peters 2003ab).

The PISA assessment for 2000 rated Finland as having the best educational system in the OECD, and the country continues to be a top performer. The Finnish Government did not develop a particular strategy to accomplish this, but three main characteristics are suggested for its success. The first one was that decisions regarding the Finnish education policies were decentralised from central government to the local communities. Teachers also had substantial professional autonomy that has developed in an atmosphere of collaboration and trust, and their teaching performance is no longer inspected by national authorities. Instead new forms of school inspections and informal pupil testing have been developed by the schools, involving school leadership and teachers.

Investment in teacher education is high, with a master's degree obtained from a research university being the basic qualification for the job. The status of teachers is on a par with doctors and lawyers, teachers belong to one professional body, and well paid. University recruitment for teacher training courses is based on a post for each individual when s/he graduates.

Sahlberg (2011) continues that the education policy aims to ensure that all children have equal opportunities to develop, and curriculum design is locally shaped by the schools. The emphasis is on development not excellence. There are no standardized tests and school days are short and teaching and learning are based on curiosity and play, with acceptance for try and error with no award or punishment systems. The curriculum balances arts, manual skills and non-academic subjects with traditional ones, and teachers collaborate and experiment to share ideas and to leverage outcomes. The main function of the government has been to provide the resources required to ensure that the curriculum is delivered in a socially balanced way, and that all students have the required support to participate equally with their peers through individualised education. Finland spent 5.7% of its GDP on education in 2013 (Sahlberg 2011; Sahlberg 2017)

The development of skills begins from three years old, 75% attending pre-primary education, prior to compulsory education, which begins at seven years old and lasts until age 16 years. There are two options for upper secondary education, academic and vocational, with an almost equal uptake by 95% of school leavers. All schools are provided by the State and no streaming, tracking or external standardised tests are present until the final matriculation at the end of upper secondary school.

However, the OECD (2015) data cited in Fact Maps (2016) found that Finland's performance in mathematics, science and reading had declined since 2006. although it remained above the OECD average. The social background also remained consistent and above average but in the 2015 assessment Finland was rated 8th globally achieving a score of 522.7 Finland is also rated 15th in the United Nations Human Development Index, scoring 0.920; this index measures an nation's overall economic and social achievement, which are scored according to citizens' level of health, educational achievement and standard of living (UN 2019).

Singapore received the highest PISA rating in 2015, with 551.7 points and, in contrast to Finland, Singapore's ratings in mathematics and reading remained at maximum since 2006. The score for science had improved to the maximum but social equity was below the average global PISA score (OECD 2016). Singapore has the highest global score for collaborative problem solving at 561 points, which is stated by OECD (2017a, p. 1) to be "significantly above all other education systems" The top level of collaborative problem solving proficiency was achieved by 21.4% of all 15 year old students, which means that they are able to conduct advanced problem solving tasks, with highly complex collaboration whilst understanding the dynamics in the group, and proactively resolve challenges such as barriers and disagreements; the global average for this skill in OECD countries is 7.9%.

The Singaporean education system is characterised by rigorous teaching methods and excellent teachers, which are the fundamental reasons for its high PISA ranking, as well as achievement at primary school and university level. However, the preferred pedagogical methods are traditional, with the teacher leading the class rather than children directing their own learning (OECD 2017a). Students rated their happiness higher than those taking the test in Finland with its progressive pedagogic methods.

Singapore is intending to introduce educational reforms to increase creativity and to reduce stress, and its success is suggested as being founded on slow evidence-led reform (OECD 2017a).

In contrast to many countries, in Singapore educational reforms are highly coordinated and approached from a holistic perspective rather than disjointed, incomplete activities. The nation's investment in education is relatively high, 2.9% GDP between 2012 - 2017 (UN 2019), as is the investment in educational research, such that new ideas are thoroughly tested and monitored before being implemented in schools (Economist 2015). The use of textbooks, worksheets and worked examples remain in use. Its expertise in mathematics is attributed to a narrow but deep curriculum which every pupil receives, and lessons are supplemented by compulsory additional sessions for those who are unable to accomplish the required understanding during scheduled lesson time (Economist 2015).

The quality of teaching staff is a third reason for success, with teachers receiving in service training of 100 hours a year so that they are familiar with the latest teaching techniques; performance is assessed annually. Teachers' salaries are equivalent to other private sector jobs, and they can opt to train their peers when they wish to move on from solely classroom activity. In addition, the best teachers are able to accomplish roles in the Ministry of Education, which has a central role and has close links with most headteachers so that its knowledge of activities within the school is high (Economist 2018).

Confirmation of changes to the Singaporean education system were reported by the World Economic Forum (Wood 2019), which states that marks and grades are to be replaced by discussions, quizzes and homework as methods of assessment. From 2019 examinations will no longer be set for the first two years in primary school but the primary school leaving examination will be retained. Less emphasis will be made regarding marks of older students. Instead of competing, the Education Minister is encouraging each student to optimise his/her learning development and has altered educational policy in this direction, a transformational change of approach.

As a consequence, academic performance and social development are fostered; self-awareness and decision-making skills being considered highly important. The Ministry of Education also recruited a group of career guidance personnel to generate a change of perception of students that the only acceptable careers were in banking, civil service and medicine. Local workplace needs are being integrated into school education, as classroom behaviours and practices focus on equipping pupils for jobs in Singapore's growing service sector (UN 2019). The Minister of Education has scheduled a programme of applied learning to be instigated by 2023 so that students can improve their personal development in terms of life skills, and these include industry focused topics such as robotics and electronics. Singapore is rated 9th on the United Nations Human Development Index with a score of 0.932 (UN 2019).

This contrast between the two models is of substantial value to this thesis, especially as Finland's rating has somewhat declined. The fact that the traditional Singaporean system could generate such high collaboration skills seems surprising and warrants more information as to how this was accomplished. The inference is that both the level of mathematics, science and literary competence requires students to understand complex concepts, and be able to apply them, and how that was achieved in the Singaporean classroom is not evident but inferred as exchange of ideas. The new system appears to build on this competence but broadens it and directs it to the needs of the workplace. The reported depth of research into educational methods prior to implementing them in schools, suggests they are likely to accomplish their intentions.

Despite the different approaches between Finland and Singapore as short school hours and days and no homework versus long hours and much homework, parallels can be detected between them for instance investment in teacher training, the high status of teaching as a career and the balance of vocational and/or work based learning and academic focus. A further implication for this thesis is that diverse cultural influences through cooperation on the educational policies and practices, can result in exceptional educational outcomes, in other words lack acceptance of the universal best practice approach. Future PISA ratings will be of interest to the UAE as it attempts to improve its position in them. Interesting is that Singapore will change its policy to less homework and no grades at primary school levels as this puts pressure

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on the kids which will not foster curiosity which is crucial for lifelong learning values to be instilled at an early age. Furthermore, Finland policy is based on development and in Singapore a switch to competition will be made.

In 2009 ADEC embarked on an education reform which included a ten-year Strategic Plan to address challenges in Public P-12 schools. The Plan is built around four main pillars; enhance quality of schools reflecting international standards, ensure quality education access for all children, make private education affordable for students and preserve national identity and culture (Buchler-Eden 2012).

The NSM proposed by ADEC stresses the importance of a 'whole child philosophy' which takes into consideration cognitive, language, social-emotional, and physical learning domains. Furthermore the NSM consists of curriculum, teaching methods, assessment, environment, resources and physical education and aims to establish a child-centred learning environment including teachers, families and community. Instilling confidence and personality into children as well as teaching skills such as critical thinking, problem solving and mastering both the English and Arabic language. The NSM covers the physical aspects of students and plans to support fine and gross motor skills in order for students to develop into healthy individuals (Buchler-Eden 2012).

Ultimately the NSM aims to nurture students to become lifelong learners and furthermore highlights that "these outcomes serve as overarching goals and will shape the choices schools make about learning experiences, resources and assessment practices" (ADEC 2011, p.13).

The rollout of the NSM started in 2010/11 with kindergarten to grade 3 and will cover all grades by 2016. The inference is that in the PISA study 2018 these NSM students will participate and the result of this will be published in December 2019.

2.3.5.6 National and Organisational Culture

This part of the Literature Review represents a transition from purely conceptual models to their application because it involves exploring the potential impact of culture on educational policies, practices and outcomes. Hence it focuses on major cultural theories, which are then applied in more detail to the UAE and to nations from which the country is most likely to have accessed support for educational reform

in a later part of this Literature Review. The concepts will be related to findings of studies regarding knowledge workers and knowledge economy including cultural comparisons between UAE context and other knowledge focused economies.

A major challenge exists in determining a universal meaning for culture, because there is no agreement on its nature, other than evidence from anthropologists that it is not an inherited but a learnt phenomenon (Hall 1976). Culture has been compared to software or programming, specifically programming of the mind that results from each individual's unique set of life experiences, including interactions with others (Hall 1976; Hofstede & Minkov 2010). However, the individual can choose not to adopt the learning s/he has observed, and individual, national and organisational culture change over time as people are exposed to new experiences, according to Hofstede and Minkov (2010). These two features of culture are important to this research, because they infer that Emirati and expatriate cultures are likely to be substantially different, but they can be shaped in another way over time. Furthermore, Dedoussis (2004) claim that it has been demonstrated that customs, attitudes, norms and values vary between countries and cultures, and Schwartz (2007, p. 12) argues that "cultural diversity may lead to misunderstandings and miscommunication. In the Emirate of Abu Dhabi only 4,319 of the 10,854 teachers working for ADEC are Emirati nationals (ADEC 2010). Hofstede (2018) argues that differences in teacher and leadership styles and structures of organisations, and in this case schools, are a cause of collective mental programming of individuals in the national culture. De Vries (2012) argues that for a cultural fit, teachers in a school or an organization need to share not only values and beliefs but also attitudes and goals.

Another challenge regarding culture for this thesis, relates to the comments made by researchers from the Arab-Islamic world, who suggest that a huge research gap regarding individual national cultures. They state that there is more literature and knowledge about, for example, Japanese management practices than about those in Arabic countries, despite the current growth rate of the Muslim population that will reach fifty% of the world's population by 2050 (Case, Hopfl & Letiche 2012). The few studies that have been published tend to generalise across the twenty-two Arab countries, which are at various development levels, according to Branine (2011).

This reasoning is derived partly from the perception that Hofstede, Hofstede and Minkov's (2010) research work on national and organisational cultural differences considers that all Arab states are characterised by the same culture, and that the Globe Project focuses on the Middle East, with none of the UAE states included (GLOBE 2018), which is even less helpful. Therefore, the inference is that cultural preferences for UAE states will need to be deduced from studies that have taken place in the UAE, such as Klein, Waxin and Radnell's (2009) investigation into seventeen small UAE firms, which found a causal link between organisational culture and national culture. Another model developed by Alyousif, et al (2010), which was employed to identify the relationship between management practices and national culture in the construction industry found that that Western and Eastern management practices were combined, but also established some Arab Islamic cultural norms. The western influences in regard to attitudes and beliefs of UAE individuals was also identified by Hills and Atkins (2013) and by deWaal and Frijns (2016), who also established that western influences impacted on traditional UAE cultural norms, in the organisational context.

Hofstede (2018) has devised the cultural dimensions for the UAE however only four of the six dimensions have been rated. The research has been criticised as cultures develop and the model is again from a western point of view. Still, the findings are partly useful to this thesis due to the lack of others, as well as valuable for comparison with other studies conducted by UAE nationals and external experts.

The four dimensions and their values are illustrated in figure 8.

Figure 8: UAE National and Organisational Cultural Dimensions
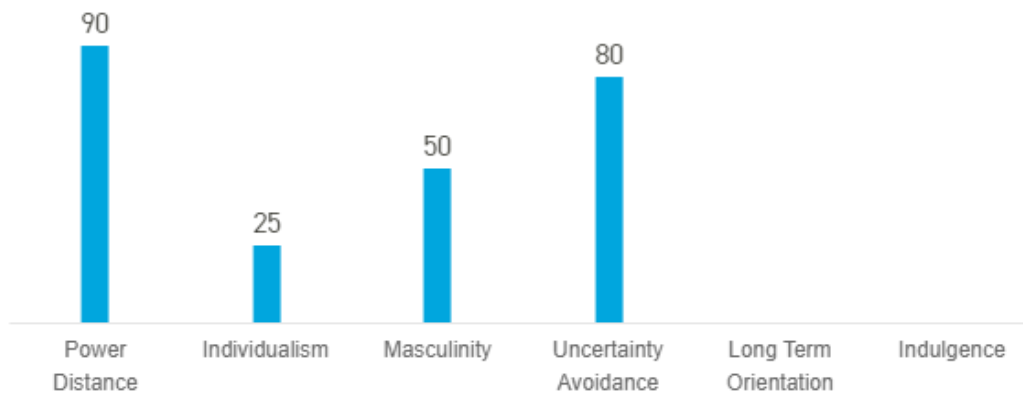
The four dimensions each represent a continuum of possible scores from a very high tendency for the trait to a low tendency. In this case Power Distance and Uncertainty Avoidance are high scores, suggesting a culture in which power is held by very few individuals and that, for instance, in the workplace senior executives make decisions, which employees implement. The implication is that there is virtually no employee involvement and that rules are imposed to reduce risk. Teachers are not involved in the policy making and have KPIs to achieve which might be a challenge in the implementation of the new models. As implementing change should be a mutual interaction between policy makers and implementers and not only top down (Huberman 1994). Furthermore, teachers and practitioners will be hesitant in giving critical feedback regarding the process which is crucial when implementing change. Furthermore in regards to power distance - sometimes a leader of a company get the so called `CEO-disease` (Dweck 2005) which means that staff are there for the leader, who should be looked at as perfect in opposite of the modern servant leadership, where the leader will need empathy (Brown 2014) in order to support his/her staff in the best possible way and therefore need emotional intelligence. The former mentioned toxic leaders are devastating as among others their followers do not trust them, which in Muslim-Arab countries is important (AlSarhi et al. 2014; Moten 2011) specifically for knowledge transfer to take place (Weir et al. 2005). On the other hand according to Rugh (2007) power and resources are shared through consultation and generosity in the UAE local culture which is not in line with Hofstede's generalised

model. This is of importance to this thesis as according to (English 2008) construction of knowledge and truth is a function of power as well. The uncertainty avoidance is a challenge in a knowledge economy as well as innovation and creativity are needed and according to Brown (2014) for this to happen, a failure friendly environment accompanying uncertainty is crucial.

The low score on Individualism indicates that performance is based on collective outcomes and rewards are shared, rather than based on individual effort. Using rewards in education and assessments will have an impact on the role education plays in an individual's life and what skills, behaviour and knowledge are assumed to be important. If we want to foster students to, for example, appreciate diversity of abilities we have to hold them accountable for their performance on the process (Robert and Ronald 1988). Hence, teachers should assess various skills and dimensions of skills and the assessment should give students credit for their effort or team work instead of solely results. Furthermore, the policy models borrowed are based on individualistic cultures and this might cause confusion and result in failure of implementing models and transitioning to a Knowledge economy.

High scores on Masculinity are associated with ambition, competition and ruthlessness in business, whereas low scores imply that quality of life is more important, a feminine characteristic; the UAE score of 50 for Masculinity suggests a balance between the two (Hofstede, Hofstede & Minkov 2010; Hofstede 2018). Further research of the specific Emirati culture is being recommended as there is a research gap. According to Haque (2007) the most important cultural and identity indicators for Emiratis are religion, language values and community. Compared to the western imported models the religion, language and values as well as the community are different which might cause confusion and challenges in the transition to the knowledge economy even though according to consultant company Korn Ferry (2019) adaptions are made the messages given and the hidden curriculum might still cause confusion. The Emiratis construct their identities on these factors and the borrowed education policies are constructed by and for people who have a different religion, language, value and relation to their community as an individualistic culture.

The impact of culture on economic growth from a capitalist perspective was the basis of considerable research by Hamden-Turner and Trompenaars (1995), but the UAE

was not included in the original work. The word culture is stated to have its origins in an agricultural setting and meant that its focus was work on the soil or ground, and that wealth creation was fundamentally a moral act that must be achieved. Hence the quality of work conducted by individuals was a combination of the values of the business founder, and of the individual's work culture; native culture was found to be the most influential aspect of values; national identity aligned with cultural preferences and their respective strengths and weaknesses regarding economic growth (Hamden-Turner &Trompenaars 1995).

The omission of UAE in the original research conducted by Hamden-Turner and Trompenaars (1995), has been rectified in a newer edition and due to the research gap and purpose of this study and its concern with how UAE can develop and maintain a knowledge society to leverage economic growth and compete globally, these ideas are included in this study. Seven cultural values were originally identified by Hamden-Turner and Trompenaars (1995), as influencing economic choices regarding wealth creation, and each of these led to a tension between the extremes in each value continuum, in a similar manner to Hofstede's (2018) cultural dimensions. The seven values are recorded in table 6, with the corresponding tensions or continua, on which national values are scored.

Table 6: Values and Associated Tension

	Values	Tensions
1	Making rules and discovering exceptions	Universalism v Particularism
2	Constructing and destructing	Analysing v Integrating
3	Managing communities of individuals	Individualism v Communitarianism
4	Internalising the outside world	Inner Directed v Outer Directed Orientation
5	Synchronising fast processes	Time as sequence v Time as Synchronisation
6	Choosing amongst achievers	Achieved Status v Ascribed Status
7	Sponsoring equal opportunities to excel	Equality v Hierarchy

Source: Author adaptation from Hampden-Turner and Trompenaars (1995)

An initial question to the global managers, who took part in the surveys for this extensive study of work and culture, was to understand what they believed the purpose of the organisation to be: either as a system that defined work functions and

tasks in an efficient manner, employees being paid for doing so, or as a group of individuals working together and characterised by social relations that determine how well the company functions (Trompenaars & Hampden-Turner 2012). The responses to this question demonstrated that in this aspect of work culture, UAE with a score of 54 is very similar to that of UK and USA, scoring 56 and 52 respectively and to China with 55, indicating that more than half of managers regarded the organisation to reflect social relations. In contrast, for example, Portugal scored 27 indicating that less than one third of managers considered the organisation to be characterised in this way. On some other tensions, the UAE demonstrates distinct differences from the USA and UK for instance communitarianism, in which it has a cultural emphasis close to that of China; collective rather than individual reward is the UAE preference. This perception of culture based on values of how wealth should be created is a key cultural concept.

Other western based research on culture by Schwartz (2006) concentrates on dimensions such as hierarchy versus egalitarianism, mastery versus harmony, relationship versus deal focus and high content versus low context. Similarly, Gesteland's (1999) study on business and culture has four dimensions, which appraise the relative importance of relationships, of formality, concept of time and openness. Therefore, there is considerable and overlap between cultural studies, at least in focus, particularly those of Hofstede (2018) and Hampden-Turner & Trompenaars (2012).

In regard to this thesis, this outline of diversity in cultural preferences strongly infers that educational practices that are integrated into western educational models will be rejected by UAE nationals, and therefore, the desired outcomes are not likely to be fully achieved. Also, the research conducted by Georgas, van De Viverf and Berry (2004) in 174 countries, emphasises the impact of religion as one of a small group of eco indices as well. The Arabic culture studies generated by native authors comprised three approaches, which were: employing the findings from international cultural sources; those which developed dimensions founded on values and preferences of Arab and Muslim groups; a focus on Islamic work ethic (Najm 2015). The research that employed international cultural concepts found that external values influenced Arab work culture more than Islamic values, and the dimension values aligned with those of the international study findings.

The second group of studies was devised as a resource for international investors potentially wishing to start a business in the region. In essence this set of studies identified two aspects of Arabic culture that had most impact on business; religious dimension in terms of extent of faith, and family and relative relationships. However, Weaver (1997) found that the emphasis on religion, and the beliefs that underpin it, varied across Arabic countries and Najm (2015) stresses that religion has a major impact in Arabic culture, but is less of a focus in some international cultural models. The third group of studies emphasises the influence of the religious aspect, the set of values that directs individuals to decide which actions are positive and those that are not acceptable, mentioning the Protestant work ethic (Najm 2015), aligning with Hampden-Turner and Trompenaars (1995) on the fundamental meaning of culture. Hence Najm (2015) refers to an Islamic Work Ethic as integrated into the national culture because Islam determines actions relating to every aspect of Muslim life, such that hard work and being thrifty represent a contribution to national economic growth. Three approaches were integrated to provide a more holistic approach to Arab culture and business culture, according to Najm (2015); the influence of the Muslim region, since Islamic teachings stressed faith based on God's teaching; the concept that the individual must attempt to use his/her potential to generate a positive outcome whether the events of life are good or bad; the intention to approach a task with the right purpose was vital even if mistakes occurred; Islamic work ethic as values that accurately define right and wrong from the religious perspective.

There are four major cultural religious aspects according to Najm (2015); avoiding evil or harm; benefiting society; ethical business contracts reflecting honesty, integrity, keeping promises and avoiding bribery; producing the best work and inflicting the least damage. These principles were categorised by Najm (2015) into the three culture levels developed by Schein (1991), figure 9

Figure 9: Arab Business Cultural Values and Levels of Visibility
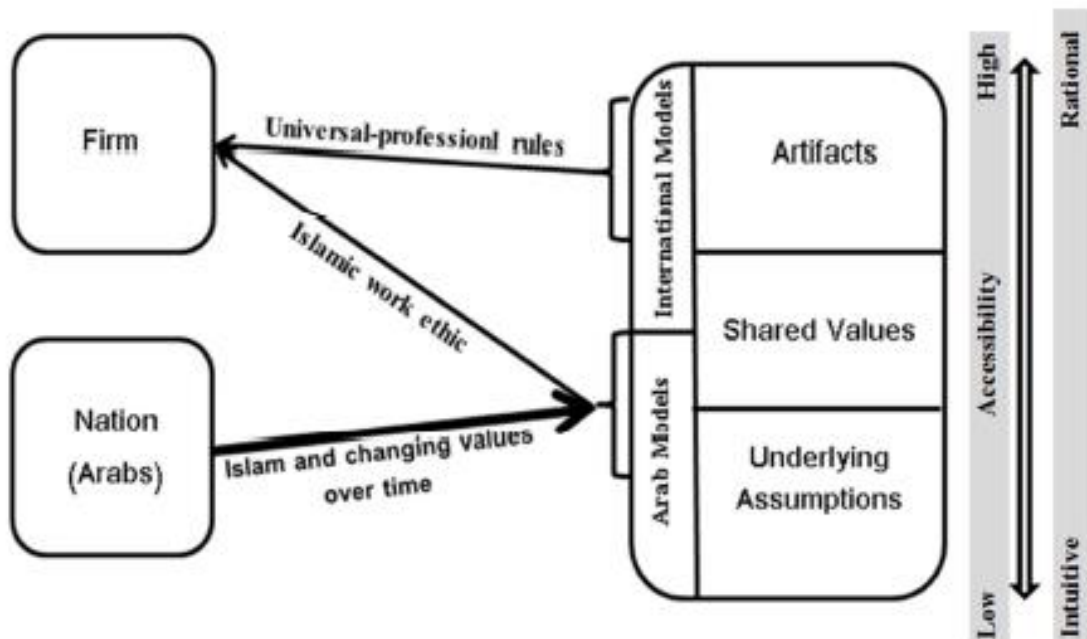
This shows that the basic, unconscious deeply held assumptions from the national religious values are the most important aspect, that they are transferred into the organisational culture and generate visible artefacts such as how processes are framed, the features, and the work environment and language used (Schein 1991). The pressure from external forces to separate the fundamental assumptions of Islamic life from the organisational situation, and hence to conflict with Islamic principles, is stressed by Najm (2015), who states that, consequently, organisations that comply with Islam coexist with those that contravene it.

In UAE schools no such subject exists that relates to ethics, values or moral teaching and learning, as Islam is supposed to teach that (Najm 2015). The implication is that there may be a conflict, as the subject may integrate into imported western education models taught in UAE school, the hidden curricula will have western values embedded even though they may be adapted to a certain degree.

This research represents a valuable contribution to this thesis, since it directs this researcher to a range of studies on the Arabic world, emphasises the influences of

Islam and the tensions that exist in UAE; it also justifies a much more in-depth study of culture and Islamic culture directly in relationship to current UAE education.

The inference from the cultural overview, and its importance in UAE business practices and in schools, is that planning and developing the appropriate associated educational change will be challenging. The need for additional models beyond those generated in the west to accomplish the UAE goal, is stressed by Reigeluth and Karnopp (2014) and referred to as highly complex by Cuban (2013). This is a consequence of various human chains being present on many levels, and because the required skillset and the role of education need to reflect the local national identity otherwise attempted reforms might fail. Figure 10. illustrates how the key theories are interrelated.

Figure 10: Interrelation of Key Theories and Authors

Knowledge Economy, skills and knowledge transfer

- UAE. (2010). Vision 2021,
- BC (2018). Future skills supporting the UAE's future workforce
- OECD
- Playfoot Hall, R. (2009). Effective education for employment: A global perspective,
- Eraut (1994). Developing professional knowledge and competence
- Nonaka & Konno (1998). The Concept of "ba" building a foundation for knowledge creation
- Nonaka (1994). A dynamic form of organizational knowledge creation
- Bellanca & Brandt (2010). 21st century skills – rethinking how students think

Triple Helix

- Peters (2003a). Classical political economy and the role of universities in the new knowledge economy,
- Peters (2003b). Education Policy in the Age of Knowledge Capitalism,
- Dixon & Dogan (2004). The conduct of policy analysis: philosophical points of reference.

New Education Models

- Levy & Murnane (2004). The new division of labor: how computers are creating the next job market,
- Levy & Murnane (2013). Dancing with robots: Human skills for computerized work,
- Cuban (2013). Inside the black box of classroom practice: change without reform in American education,
- Reigeluth & Karnopp (2014). Reinventing schools: it's time to break the mold,
- Sahlberg (2011). Finnish lessons: What can the world learn from the educational change in Finland,
- Sahlberg (2017). How we teach our children: The methods and myths behind Finland's education success

UAE Context

- Hofstede, Hofstede & Minkov (2010). Cultures and organizations: software of the mind
- Ali (1996). Organizational development in the Arab world
- Al Ateeqi (2009).The role of education in meeting global challenges: we have come a long way: redefining education and its global challenges in the United Arab Emirates

2.4 Review of Related Literature

2.4.1 Overview UAE and Knowledge Economy

The relevance of the knowledge economy to the future prosperity of the UAE was demonstrated by the initiation of the His Highness Sheikh Mohammed Bin Rashid Al Maktoum's IT Education Project (ITEP) in Dubai in 2000, according to Lightfoot (2011); UAE linked ICT with knowledge acquisition. The UAE economy has traditionally been described by economists as an example of a rentier state (Weber 2011), which infers that the majority of its revenues are derived from accessing reward for the ownership of natural resources (Beblawi 1987).

The consequences of high oil revenues are that the UAE and similar countries have been characterised by providing citizens with direct income and or subsidised healthcare, education, water and electricity. Nationals were able to obtain high income jobs in the public sector such that the majority of them were employees in Government based jobs and a minority worked in private sector firms. In addition, higher education focused on Arabic and English literature, humanities and the social sciences generating a severe shortage of engineers, ICT specialists' workers, scientists, and researchers; critical thinking and innovation was not emphasised in education and training.

In 2008, the UAE Government established the National Research Foundation as a means to encourage all its universities and research centres to combine their efforts to generate high quality innovation activities that would support the nation's competitiveness globally. Subsequently the institutions could apply for government grants for research into science, technology and social sciences, but delays were experienced in processing applications as a consequence of the global financial crisis in 2008. This has significantly hindered goals being met, and it is difficult to assess how, and if national research funding has made an impact in contributing to the knowledge economy, according to Alfaki and Ahmed (2017).

In 2012 only 0.2% of GDP was allocated to research funding, and just 0.15% was spent, such that a report by Federal National Council was critical of UAE university leaders, and strongly recommended more funding for university research and less for

teaching (Hivdt 2015). This situation reflected the general impression the universities in the UAE were teaching institutions with little interest in research.

A study on the progress being made by the UAE towards the knowledge economy, conducted by Ahmed and Alfaki (2013), which found that progress had occurred in implementing the four knowledge economy pillars, in particular at the macroeconomic level and regarding ICT infrastructure. The data sources from the World Economic Forum Global Competitiveness Reports from 2006 to 2012 showed a 3% increase in technological readiness but a 9% decrease in the availability of the latest technologies, and in broadband and internet subscriptions; mobile broadband had been adopted by 44% of the population from zero in 2006. At the firm level technological absorption had fluctuated and was lower in 2012 than in 2006. Therefore, UAE had implemented some factors relevant to the knowledge economy but had not transitioned to an efficiency driven one.

The slow progress in transforming to the knowledge economy was also indicated by the UAEs continuing dependence on the manufacturing sector of the oil industry although this has somewhat reduced, but the gap had mostly been replaced by labour intensive industries employing low level technologies. The country was also importing technology and technology products (Alfaki & Ahmed 2017).

A study by Hameed et al. (2016) also tracked the progress of the UAE knowledge economy and found evidence from the Global Entrepreneurship Report that there had been no increase in new middle or high technology business ventures from 2006 to 2011. In reality there had been a slight decrease, with 2.3% of total new enterprises in 2011 being high or medium technology organisations, and the vast majority being low technology firms, as had been the case in 2006. The fundamental reason for the low entrepreneurship was the lack of appropriate education and the collectivist native UAE culture; an individualist culture favoured successful enterprise according to Hameed et al. (2016). On the other hand, Singapore, as discussed in detail above, is also a collectivist society and culture.

The lack of practical application of ICT in the UAE was considered remarkable given that UAE had the sixth highest expectation rate for business start-ups, it was one of the wealthiest nations, and was rated 31st globally for ICT infrastructure. The conclusion drawn to explain the paradox was that the UAE had the financial and

technical resources to create the ICT infrastructure but lacked the social and physical foundation to deliver the knowledge economy, with entrepreneurial education being a critical factor.

However, the UAE scored 4.95 out of a maximum of 7 points in terms of the availability of scientists and engineers, according to a 2012 report, which Alfaki and Ahmed (2017) proposed was an indication of the nation's potential to generate high quality innovation on a large scale. The low number of research papers written by UAE researchers from 1996 to 2010, amounting to 12,914, indicated that this potential was not being implemented. The UAE was rated 66th globally for research generation, lower than South Korea and Saudi Arabia, which had three and thirty-three times more publications than the UAE respectively, and both has lower numbers of scientists and engineers. Sixteen UAE universities were the predominant producers of 4925 research papers in science and engineering in the period 1996 to 2010, and 93% of all papers were mostly related to medicine and engineering. In addition, the majority of research papers had been produced with international cooperation, which demonstrated poor local collaborations, according to Alfaki and Ahmed (2017).

The level of patent registration during the same period is another indicator of the level of entrepreneurship and innovation, the UAE registered 85 patents with the United States Patents and Trademarks Office, South Korea registering four times as many per million of population. The research by Siddiqi et al. (2016) confirmed these indicators, finding that UAE's share of global science and engineering academic papers in 2011 was 0.07% rising from 0.04% in 2001, but the indigeneity of the authors, the proportion generated by Emiratis, had declined from 0.77 to 0.59. In contrast Saudi Arabia has increased its global share of publications from 0.015% to 0.039% in the period 2001 to 2011, but there was also a decline in proportion with domestic authors from 0.81 to 0.52. The study found that in countries in the Middle East and North Africa had generally shown a decline in the indigeneity of research in these sectors, which Siddiqi et al. (2016) propose as highlighting uncertainty about domestic research capacity without outside collaboration. The data also reflected the low productivity and low research levels (Siddiqi et al. 2016)

The shift away from geological and chemical engineering was a concern since the relevant countries would need to rely on the sector for many decades, and contrasted

with Norway also an oil producing nation, in which research interest in this field has been maintained. The study identified research trends in specific subjects, shown in figure 11, where Research Scientific Advantage (RSA) values indicate specialisation and a value greater than 1 that the nation produces more publications than global average, whereas a value less than one that the publications are less than the global average.

In terms of geological and chemical engineering, Norway's research rating in RSA 2.5, increasing, whereas UAE's RSA, the yellow line in the graphs, has declined from 1.5 to 1 in the past 20 years and chemistry and chemical engineering shows a similar trend.

Figure 11: Trends in UAE Research Publications RSA Values

MATERIAL SCIENCES

PHYSICS/NUCLEAR SCI
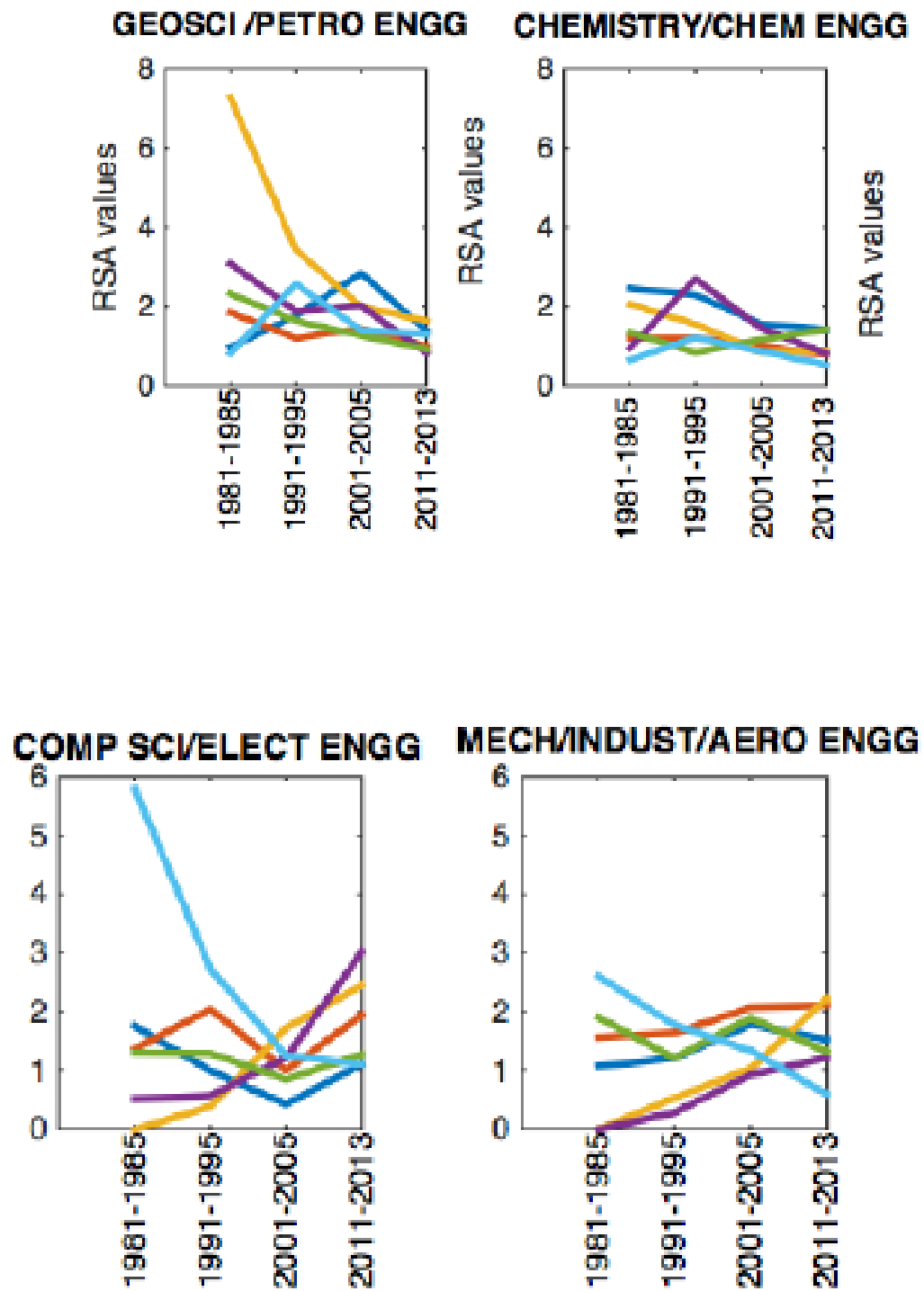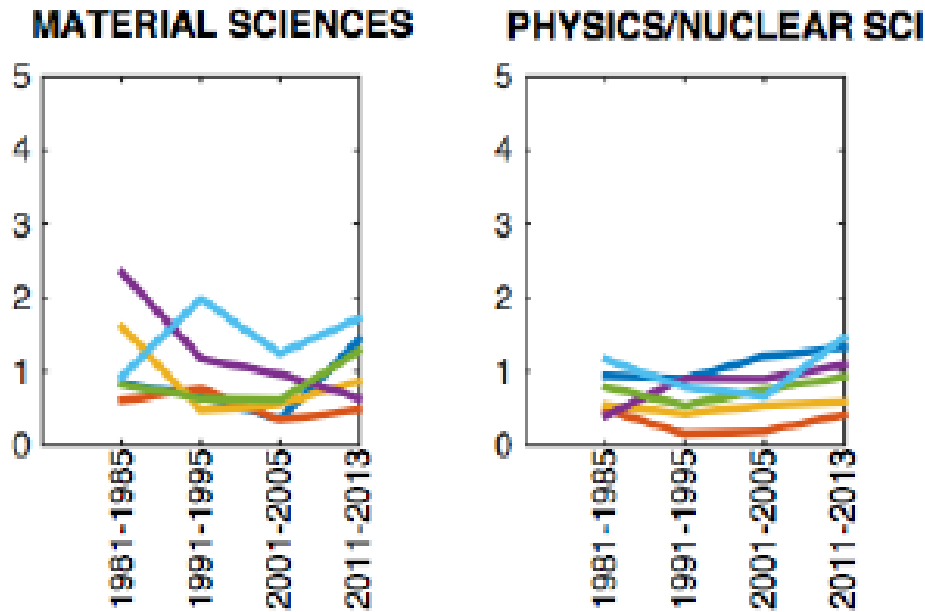
(Country key: Yellow = UAE; Dark blue = Iraq; Orange = Kuwait; Green = Saudi Arabia; Purple = Qatar; Turquoise blue = Bahrain)

Source: Siddiqi et al. (2016, file S1, pp.26-27)

Research publications have increased for Computer Science and Electrical Engineering, which has sharply risen to RSA 2.5, Mechanical Industrial and Aeronautical Engineering from RSA 1.5 to 2; material sciences and physics and nuclear sciences remain less than RSA 1 and mathematics is one of the declining RSA value trends (Siddiqi et al. 2016). These publication trends tend to reinforce Alfaki and Ahmed (2017) that ICT has been a focus and that the quantity of research occurring in the UAE generally is low. The United States as a research benchmark generally has RSA of at least one in all academic disciplines. The limitation of this study is that neither the quality of research is not indicated nor is the citation rate.

In the interviews that were held by Siddiqi et al. (2016) with academic staff in MENA universities and with other stakeholders, several barriers to improving innovation and creativity were expressed, including: the difficulty of attracting quality staff to the faculty; lack of longer term career prospects which deterred interest in long term research and technical work in science and innovation; the poor quality of school education in science and mathematics, which left students ill prepared for university education; the need for forward looking policies with continuity in funding for science

and technology over the next 20 years; lack of colleagues with shared interests and expertise; lack of incentives for institutions to publish research.

The World Intellectual Property Organisation (WIPO 2018), which describes its activity as the United States global forum for services, policy, information and cooperation, with 191 member states, provides some current data on research in UAE by means of patents applied for and registered. The number of patents in force increased from 451 in 2013, to 874 in 2017, whilst patent application by residents rose from 30 to 85 and by non-residents from 1408 to 1748 in the same period. Registering a patent under the Patent Cooperation Treaty (PCT) protects the owner of the invention in many international countries, and those relevant to the UAE, are summarised in table 7 and tend to reinforce other studies in this section, regarding the few firms and institutions, which are active.

Table 7: PCT - Top UAE Applicants

PCT Applicant	2015	2016	2017
Dubai Aluminium PJSC	1	3	12
Khalifa University of Science, Technology and Research	10	12	9
Extreme Flight Fze			5
Petroleum Institute	1	1	5
Abu Dhabi Polymers Company Limited (Borouge)	7	11	3
Masdar Institute of Science and Technology	2	2	3
Dubai Electricity & Water Authority			2
SMI Oilfield Equipment and Products FZE			2
United Arab Emirates University	11	11	2
Ateis Middle East Fzco			1

Source: WIPO (2018, p.1)

It is notable that only two universities registered patents and that numbers registered have not increased in the past three years, whilst only on private company has substantially increased patent applications over the period and four new organisations registered in 2017. The research study by Hvidt (2015) also showed that the number of patents for innovation from 2009 to 2013 was a yearly average of 12.8 and only 120 such patents had been filed in the fifty years from 1963 to 2013.

In 2017 to 2018, Nature Index found that UAE institutions published 77 academic papers in high quality science journals: physical sciences 27; life sciences 30; chemistry 12; Earth and Environmental Sciences 8. Thirty-nine papers were produced by 10 institutions; Khalifa University of Science and Technology 9; University of Sharjah, 13; United Arab Emirates University 6 (Nature Index 2018).

This data is very useful to this thesis in reducing the knowledge gap of progress in the UAE goal towards the knowledge economy and indicates a substantial gap between intention and implementation. However, much of the data is now more than five years

old so that the current status is not known, but accessing more recent, reliable and independent data is extremely difficult. The patterns that these studies have demonstrated, indicate the value of this thesis, especially since no mention is made of business involvement in research or focus on the needs of business leaders.

The UAE labour market comprised over 2.5 million active workers (Schiliro 2013) comprising 86.5% male and 13.5% female employees. However, 90% of the workforce are migrants, among the highest proportion globally and most are temporary workers (McPhillips 2017). The labour force analysed by skills comprised 9.14% specialists, 3.29% technical staff, 9.43% professionals, 30.06% skilled and 48.04% semi-skilled workers (Eposito, El-Sholkamy & Fischbach 2017).

Obtaining employment is based on a sponsorship system referred to as Kafala, in the private sector each employee must have a sponsor or Kafeel, and in the public sector it is the Government Department; hence employment is dependent of conforming with the legal system. The Emirati national worker is protected by a set a government rules that limit the competition to any job s/he might apply for and every company has a minimum quota of Emirati workers it must employ (Schiliro 2013), firms employing over 50 people must have at least 2% Emirati employees (QAA 2017). The Emirati is also relatively well protected from being dismissed from his/her job. These conditions lead to national employees sometimes lacking the motivation to acquire the desirable employment skills, that lower productivity and competitive advantage of UAE firms (Schiliro, 2013).

However, McPhillips (2017) notes that despite this system remaining in force, the UAE approach to the labour market is changing because it is attempting to move from an industrial to a knowledge economy. One strategy for achieving an enhancement of Emirati human capital has been to introduce Emiratis into the workplace to shadow a skilled worker, which is stated to be more cost effective than national training programmes. The acquisition of skills in specific sectors makes the Emirati more attractive to the employer and more likely to obtain a permanent post at a high salary. One of the key sectors in which this was occurring was finance, specifically sovereign wealth funds, but also in national oil companies; foreign executives reported as being replace by nationals (McPhillips 2017).

Although the UAE Government's strategic employment focus is for more Emirati young people to enter the private sector, research has demonstrated that private sector employers consider that the UAE education system fails to instil the required skills, attitudes and training for the workplace, and this is reinforced by the below average results in mathematics, science and critical thinking skills based on international indices. The Government has attempted to address this by high investment in higher education opportunities, according to Eposito, El-Sholkamy and Fischbach (2017).

A report by QAA (2017) highlighted International Labour Organisation data from 2014 to emphasise the main employment activities in UAE, the construction and building sector related to 20% total employment, wholesale, retail trade and repair services to 18.5%, manufacturing accounted for 11.6% and government services 11.5%. The government had set a goal of 5% Emiratis to be employed in the private sector by 2021. However, the public sector remains the largest UAE employer, benefits are a substantial attraction, so that most Emiratis prefer working in this sector rather than for private companies; most Emiratis work in high and medium skilled jobs in this sectors as managers, technical professions and legislators (Eposito, El-Sholkamy & Fischbach, 2017).

2.4.2 Skills and Knowledge Required for Knowledge Economy

The advances in technology increasingly simplify and automate tasks, enabling them to be completed faster and at lower cost; computers, new software, artificial intelligence have all contributed to shaping a new type of workplace over the past 30 years. The skills that were traditionally required in workplace have also changed, with the need for the employee to take more of a managing and monitoring role to ensure that organisational performance is accomplished to the required quality, cost and time factors. The capacity to deliver performance in this context requires the higher-level skills associated with well qualified personnel (Autor, Levy & Murnane 2003; British Council 2018).

A research project on future skills needs conducted by the British Council (BC) (BC, 2018) is significant to this thesis because the participants interviewed comprised 507 UAE senior business executives, and a relatively rare example of employer perception. The report contains substantial detail that is specifically required to support further research into employer perception of UAE current educational preparation for the workplace, and therefore appraised in detail.

The main research findings were that employers, educational authorities and institutions should be collaborating and regularly exchanging ideas on developing the skills needed for the knowledge economy. Skills that were associated with learning Science, Technology, Engineering and Mathematical (STEM) subjects and multi-language capability including English; 77% of business leaders participating in the survey stated they were extremely important or somewhat important.

The report stresses the requirement for human skills and perception to complement those of Artificial Intelligence and automation and, although many jobs will disappear, the trends in technology associated with Industry 4.0 will have a direct impact on UAE's capacity to become a knowledge economy. The types of skills that will no longer be needed are those that can be automated, such that many jobs will be lost in telemarketing, accounting, technical writing, property development, retail selling and accounting. Automation will also impact on the public sector, as robots complete low skills tasks. Therefore, any type of job that requires pattern recognition and routine tasks will be automated in some way with the predicted loss of 47% jobs within ten years.

The changes associated with the advent of Industry 4.0, for instance cloud computing, mobile internet, video conferencing, which increasingly generate the capability for transnational virtual working are particularly precarious for young Emiratis, since they will not only compete for jobs with a high foreign physical workforce but with knowledge workers globally. A knowledge worker is forecast to spend 41% more time employing critical thinking skills, 77% more time using science and mathematical skills, whilst the need for management will decline by 26%, but the nature of these skills will continuously change, such that the skills of lifelong learning will be vital to career enhancement. Individuals will also need to adapt their skills sets because neither lifelong jobs nor careers will be the norm; the forecast is that each person will change jobs at least 17 times in his/her working life and occupy five different careers. Therefore, flexibility, capacity for new learning, managing change are vital attributes (BC 2018).

The importance of focus on new skills is reinforced by the UAE government already adopting Artificial Intelligence in the workplace, for example a 3D printing strategy, blockchain for transactions, electric vehicles, renewable energy and flying taxis; BC (2018) notes that UAE is globally renowned as an early adopter of new technology. The Government identified the sectors that will deliver its knowledge economy goals as manufacturing, travel and tourism, trade and logistics, financial services, technology, media and communications, and energy and petrochemicals. The interviews with private sector firms confirmed that these sectors, which appear to be traditional, are changing rapidly owing to the influence of technologies being applied in businesses.

Individual workers will need to be more flexible regarding working hours and context, highly collaborative and prepared to work in agile teams that are formed for a project and comprise individuals with the specific skills needed for it, and then disbanded. STEM skills and training will be vital across the six targeted sectors, for instance in manufacturing, technology, media and communications, and energy engineering, research and development, product design and marketing skills will be particularly important. An additional factor is that these skills can be exported and exposed to knowledge transfer, which continuously strengthens their human capital value.

Despite the identification of STEM skills as underpinning future economic advantage, emphasised by 75% of survey participants, and English as the global language of business and vital to all six targeted sectors, neither the education authorities nor employers were sufficiently promoting their criticality (BC 2018). In fact, employers surveyed stated that UAE graduates had not acquired technical skills associated with STEM or generic skills, such as the capacity to analyse, communicate, use and apply core technologies, team working, collaboration, critical thinking and English. The fundamental need for English was identified by the financial services and property market as the default language for all legal documents. However, most UAE student fail the English test in their final school year, and some take a one-year Foundation Course prior to university; a final score on the International English Language Testing System (IELTS) 5, or of 1,100 on the Emirates Standardised Test (Emstat). This trend has a highly negative impact of the national education budget, as it effectively reduced higher education funding for vital new research and innovation by one third in 2017; this is reinforced by Salem and Swan (2014), who stated that the practice was to end owing to its consumption of educational budget. The seriousness of the issue is further demonstrated by BC (2018) who expected the Foundation Year to be retained for some time after it was scheduled to end. An additional finding was the need for prospective employees to have acquired qualifications from the highest quality institutions, globally recognised as proficient.

The BC (2018) interviewees were asked to select the most important skills required in the future knowledge-based workplace, and to rank each as first second or third most vital, the findings are summarised in figure 12.

Figure 12: Employer Ranking of Required Skills
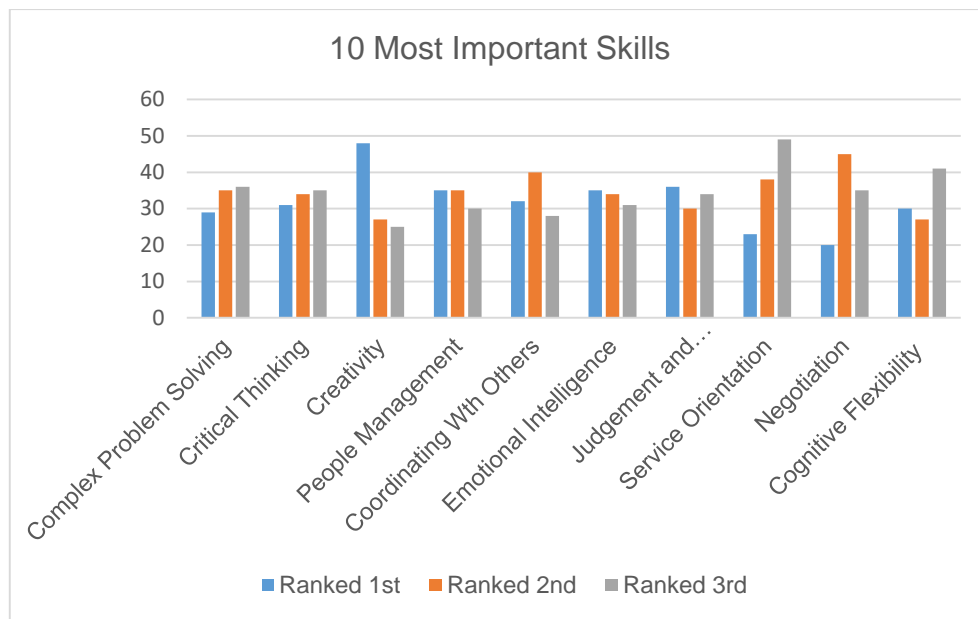
Each of these skills was defined, which is useful to this research, since it enables the clarity on its meaning to employers and comments were made regarding specific skills. Complex problem solving is described as high-level cognitive process that adjustment a control of fundamental skills, whilst capacity in Critical Thinking is associated with being able to objectively analyse and evaluate an issue and express a judgement.

Creativity is expressed as the ability to suggest new ideas by using imagination. This skill was the highest rated skill, considered the most important because it required a certain mode of thinking that was curious, open minded, tolerant and embraced diversity as a learning tool. Creativity skills developed over time and were not specific to any academic or workplace discipline. Hence, developing this skill was a major function of educators at all educational levels.

People Management skill is associated with proficiency to train, develop and motivate others to generate high performance outcomes. Coordinating with others infers effective, efficient collaboration across organisational departments or across borders, in order to complete a complex activity or to develop positive working relationships. This skill was stated to align with the UAE economic model, which was a business

hub characterised by high speed global connectivity including trade links and requiring high level skills in the English language.

Emotional Intelligence is associated with self-awareness and control of own emotions and capacity to manage interpersonal relationships with empathy and equanimity. Judgement and Decision making is described as having the ability to make decisions or perspectives regarding actions to be taken in an objective and judicious manner, have a different perspective, and to reach an agreement. Cognitive flexibility is directly related to aptitude for the individual's brain to switch thinking from one concept to another.

The participants (BC 2018) stated that the Ministry of Education had provided no platform for linking educational policy makers and providers with employers so that no strategy existed for developing the required skills for knowledge workers during the formal educational system. The focus of education recommended was teaching individuals how to learn by questioning concepts, reflecting on them and applying them.

The UAE educational curriculum required substantial change, with input from employers, in order to deliver the skill sets needed for work; employers needed to be an integral part of the system by means of apprenticeships and other practical learning activities. Data mining and statistical analysis skills were identified by Linked-In as vital to UAE competitiveness and need to be developed in the school environment, but they are not integrated in school curricula generally (BC 2018). The cost of providing education was not the issue since UAE was the second highest investor in education globally (BC 2018); this statement implies that investment is not being optimised.

The BC (2018) report reconfirmed that locals continued preference for public sector employment and their incapacity to compete in the private sector because of their skills gap. The overall recommendations included the need for students to acquire portable skills including creativity and critical thinking, to have developed high level communication skills including language competence in English and native language, and competence in STEM subjects. Although this study was conducted by the British Council, which has a significant self interest in promoting the English language, it

remains very valuable because it was conducted in the UAE with key employers and embraces the other skills that they consider vital to deliver the UAE's economic goal.

The framework for 21st century learning created by The Partnership for 21st Century Skills (2011) also emphasis lifelong learning, innovation, creativity, critical thinking, communication and collaboration and technological skills, which integrate information and media literacy, social and cross cultural, and self-direction skills.

The study by Hameed et al. (2016) is of additional interest to the thesis, firstly because it confirms the lack of link between education policy and economic policy, and secondly because it integrated quantitative methods to assess how innovativeness, motivation and need for achievement were linked to entrepreneurship and, therefore, a vital component of entrepreneurship education. The study emphasises the importance of SMEs to any economy and job creation, at least 30% of GDP and 86% of employment, and that UAE Government has initiated two funding bodies to support start-ups but that primary and secondary education did not equip students with entrepreneurial skills, for instance innovation and creativity; banks are also less likely to provide funding owing to the skills gap. Previous studies had identified the issue and suggested that entrepreneurship education be integrated into school, university, technical institutions and training programmes, for instance Hattab et al. (2014). A quantitative survey of 300 graduate and undergraduate students in the final stages of their studies was undertaken at Al-Ain University in UAE, and 251 questionnaires were completed. The hypotheses tested in the research suggested that entrepreneurship education generated self-confidence, a sense of being in control, capacity for risk taking such that individuals are motivated to achieve and to innovate. The average age was 22 years and 77.7% of participants were male and 37.5% wished to start their own business in the future. Entrepreneurship education was found to increase a positive attitude and therefore self-confidence but not necessarily innovation. However, an internal locus of control and risk-taking capacity were influenced by entrepreneurship education leading to innovation, a need for self-achievement and motivation to achieve. Therefore, entrepreneurship education within the educational system was recommended as likely to enhance innovation and start-ups in UAE.

A report by Kressner (2016) was focused on the skills needs of the UAE Technology, media and telecommunications sector, and stated that appropriate graduates would have followed a curriculum comprising coding, software, data, algorithms and who could employ innovative designs and theories to develop new products. However, knowledge and skills of this nature were not included in standard educational programmes in UAE and therefore work was outsourced to skilled immigrants rather than providing jobs for Emiratis. Still according to ADEC (2010) the implementation of the NSM is starting with kindergarten to grade 3 in the academic year 2010/11 and will be gradually rolled out in additional grades until 2016 in the Emirate of Abu Dhabi. The NSM will be discussed later in the literature review.

The gender gap was also expressed diminishing the UAEs capacity to provide the supply of skills to meet industry demands, because females were discouraged from participating in STEM subjects from an early age. Some general progress had been made to stimulate more technology-based skills because, some computer skills including basic coding had been integrated into the curriculum, since the end of 2015.

2.4.3 Studies Relating to UAE Culture, Knowledge Economy and Educational Policy

2.4.3.1 National and Organisational Culture

This part of the related literature focuses on general organisational cultural aspects related to the UAE, those related to the current educational context, to the educational and pedagogical concepts.

The characteristics of knowledge workers were identified by a study based in the United States and China by Zhan, Tang and Zhang (2013), and then the motivation of Chinese and United States' (US) knowledge workers was investigated to establish any cultural differences, referring to Hofstede's (2018) dimension scores by nation. A knowledge worker, when identified by his/her individual characteristics, has been described as a person whose approach to solving problems and completing tasks is based on intellectual input, authority and professional skills, and who possesses high levels of human capital. S/he can independently and creatively complete diverse work assignments and create value by using his/her knowledge which is continuously extended by new learning resulting from complex environmental change. Knowledge workers also had the capacity to use modern sciences to leverage productivity (Kang, Tang & Zhang, 2013).

The systematic Literature Review analysis in this study by Zhan, Tang and Zhang (2013) identified 35 characteristics and found additional factors, for example knowledge workers were found to be more independent and loyal than other types of employees, and the boundary between leader and worker was no longer well defined but rather an emphasis on teamwork. Two aspects of knowledge workers in China and US were investigated; motivation and incentives in personal growth and development, job challenge and personal achievement.

In western countries, work independence and personal growth were amongst the top five preferences, which Zhan, Tang and Zhang (2013) attributed to low scores in UAI and PDI but high IDV, in other words able to make own decisions, take risks and be rewarded according personally generated outcomes. In contrast, in China the level of compensation was found to be the vital incentive for knowledge workers, as well as challenge and promotion prospects. The high-Power Distance (PDI), low

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Individualism (IDV) and low Uncertainty Avoidance (UAI) preference of Chinese workers meant that the input of the formal leader was preferred, collective results motivated individuals and individuals were comfortable with ambiguity and risk taking (Zhan, Tang & Zhang 2013; Hofstede 2018).

The inference for this study is that UAE knowledge workers are not likely to be incentivised by the same factors as those of other nations or foreign employers based on the comparison of UAE with China and the US shown in figure 13 (Hofstede 2018).

Figure 13: Cultural Preferences UAE Compared with China and US
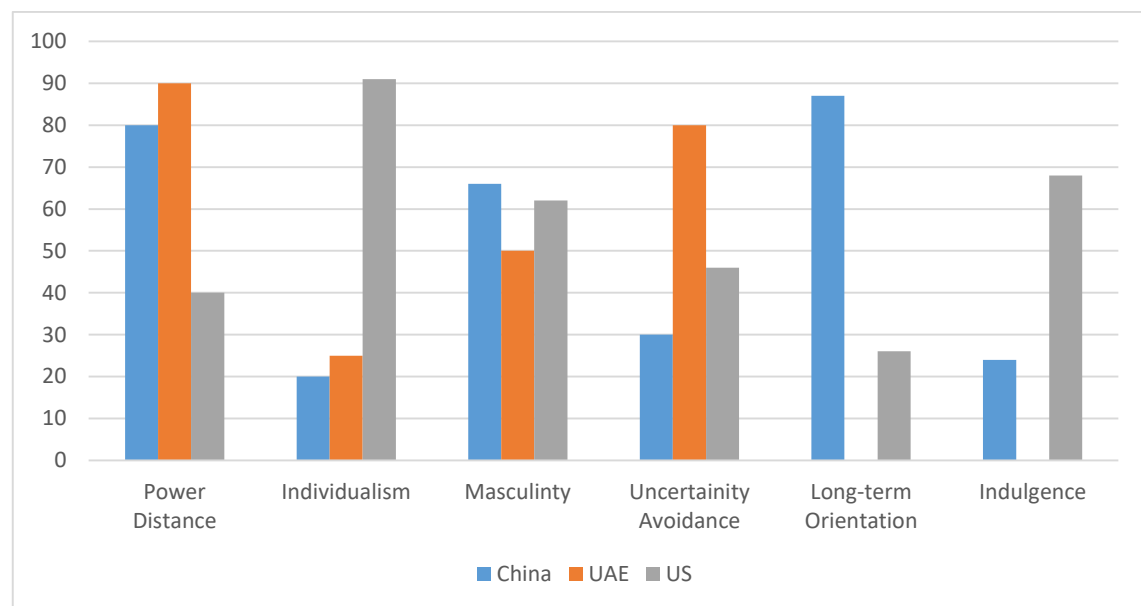
The UAE scores for Power Distance, Individualism are very similar, but UAE nationals are much more risk averse. However, they are more likely to be incentivised as knowledge workers by the collective, harmonious working environment and less involvement in decision making. Therefore, based on the findings from Zhan, Tang and Zhang's (2013) study and Hofstede (2019) dimensions, UAE preferences do not align with those of US nationals suggesting the possibility that neither US company values nor a US based educational or entrepreneurial education programme will generate motivation to be a knowledge worker without adaptation. Risk aversion of

UAE nationals will be important to address as it implies resistance to the risk taking associated with innovation.

The cultural work preferences of Arabic country nationals were also studied by Weir and Hutchings (2005, p. 95), and the UAE risk averse nature was also highlighted in the context of a negotiation in which the UAE personnel appear to have made a decision in the perception of foreign contacts. However, it was quite likely that the Arabic national would review it, because 'not yet' was a regular decision outcome so that a potential opportunity was not lost by stating a definite no.

The Power Distance and Individualism aspects were also alluded to by Weir and Hutchings (2005), in that Arabic nationals tended to be consultative, despite working in an environment in which the few individuals that had power and were the decisions makers. This apparent paradox was the consequence of acknowledgement of the value of gathering and examining available knowledge by a variety of formal and informal processes especially from those who appeared to possess it, who are referred to as having wasta. The term wasta is attributed to persons, who have good contact networks, are trustworthy and perceived as receiving the highest quality information (Weir & Hutchings, 2005). Hence wasta appears to be a native high skill of networking for relevant knowledge and possibly relevant to the required UAE knowledge worker skill set.

However, wasta is perceived in positive and negative contexts, for instance de Waal and Frijins (2016), suggest that the strong influence of wasta is a difficult barrier for foreign nationals doing business in the Middle East. Wasta is described by Barnett, Yandle and Naufal (2013) as having traditional local links such that favourable treatment is afforded to others in the same group, and often applied to gaining good employment. Whilst Walsh (2018) tends to confirm the fact that wasta influences the speed with which an individual can do business or gainful employment, the connectivity through contact network is also emphasised.

The ability to network, which Weir and Hutching (2005) stress is an important UAE cultural norm from childhood and is likely to be a highly valuable skill in the knowledge society when applied appropriately. This aspect of UAE culture should therefore be fostered in educational and training sense, in terms of complementing existing networks by building additional internal and external context networks to

increase personal and organisational knowledge. In the educational context, wasta should therefore be shaped in its positive sense as an asset and a desired skill for the knowledge economy.

2.4.3.2 Employment and Education in UAE

The UAE has a literacy level for all at age 15 years and above, with 93.8% being measured as literate in 2015, and a 2.7% higher percentage of females than males. The unemployment rate as a percentage of the total workforce in the age group 15 to 24 years was 12.1%, but with almost three times as many female unemployed as males in 2008 records (CIA 2018). However, Statista (2018) reports a gradual decline in youth unemployment to 4.93% by 2017, with data obtained from the International Labour Organisation (ILO).

Traditionally many UAE citizens have been employed in the public sector because they perceived working in the sector provided them with higher status and more rewarding prospects, therefore they tended to avoid private sector employment (Duncan 2018). The proportion of UAE nationals employed in the private sector is much lower than their share of the employed population, owing to this employment preference (Carvalho, Youssef & Dunais 2018).

A report by Reuters (2011) found that there were 35,000 unemployed Emirati nationals in the UAE and only 7% of the employed Emiratis work in the private sector. The current Government strategy is to continue to increase the number of Emirati nationals in the private sector, referred to as Emiratisation, which has been occurring for several years. One of the reasons for this action is that Emiratis must participate in the UAEs economic development (Duncan 2018) and another is the reduction in oil revenues, such that public sector spending must be curtailed. An important potential indirect outcome is that the private sector will be perceived as being more attractive, especially as several global organisations are willing to participate in the two leading UAE States, Abu Dhabi and Dubai (Duncan 2018). Additional strategies by the UAE Government to induce more Emirati participation in the private sector, includes the introduction of an e-portal intended for the self-employed enabling entrepreneurial Emirates to access information on support programmes and services. The Government also intends this to be part of an initiative

for talented self-employed Emiratis to communicate and to collaborate with private and public sector organisations.

An important employment initiative for Emiratis in relation to this thesis is the Government's intention to develop education programmes for working Emiratis so that they are able to adapt their current skill set to that which matches future market needs (Duncan 2018). The inference of this strategy is that the curriculum will have been developed with private sector employers and provide an indication of the skills and knowledge that must be integrated in the school curriculum.

The report on education in the UAE by United States Government (USGov 2018) and intended for potential investors in the Emirates states that there are 580 schools, which educate approximately 545,000 students. The public-school sector represents approximately 40% of the total, whereas private schools direct the learning of 500,000 pupils, and they adhere to different curricula. Public schools are guided by the Arabic curriculum devised by the UAE Government but private schools deliver highly diverse learning programmes, 17 in total, varying from the national curricula designed by the United Kingdom, United States, India or the UAE Ministry of Education, to range of national curricula based on the nationalities of more minor ex-patriate groups; 90% private schools implement the first four programmes.

All students must attend school until they reach 15 years old, completing primary and preparatory stages; the secondary stage is of three years' duration up to age 18 years. The trend to complete secondary education is increasing but mainly from the private school sector (USGov 2018). However, the UAE Education (2019) states that 18 years has already become the mandatory leaving age in UAE. The non-compulsory education aspects are the higher education sector or the third level of the UAE education system, a kindergarten system, which exists for ages 4 to 6 year, with primary beginning at age 6 and adult education to improve adult literacy. All State school education for students from 6 to 18 years is free, for Emiratis and expatriates (UAE Education Info, 2019).

The total school population comprised 16% UAE nationals and the remainder are the expatriate population, which is not evenly dispersed throughout the seven UAE states: Abu Dhabi and Dubai comprise 67% of the total UAE population, and 55% and 91% of their respective population are expatriates. The private school population in these

two cities is increasing annually (USGov 2018). The inferences of this highly concentrated expatriate population in two states is that non-Arabic cultural influence will be strong in both the private education sector and in business organisations.

The UAE government funding for modern public-school education was 21.2% GDP in 2016 with focus on technology and environment, and aspirations for world class standards. The allocation of funds also aimed to increase the number of qualified teachers, to implement professional development for teachers, introduce performance assessment and to redesign the curriculum. The strategic aim is that by 2021 all educators and managers in the public-school system will be professionally qualified. A pilot of a new school curriculum was launched in nineteen public and private schools in 2017, and included a new subject, moral education, with the objective of fostering an ethical society based on national culture, heritage and loyalty, tolerance and respect.

Public schools are subject to national government Ministry of Education inspection and standards, except for Dubai and Abu Dhabi in which the Knowledge and Human Development Authority (KHDA) and the Department of Education and Knowledge (ADEK) are the respective state authorities. Both KHDA and ADEK are Emirate level government authorities, not federal.

Private schools must register by law with the Department of Education and Knowledge (ADEK), which collaborates with the Ministry of Education to devise the UAE Education Plan. ADEK developed a strategic plan with the purpose of rapid improvement of school performance, such that private schools are inspected according to the Private Schools and Quality Assurance (PSQA) initiative.

Approximately 24% of private school students, 52,000 individuals, in Abu Dhabi, Al Ain and the Western Region are UAE nationals. The number of UAE nationals attending private rather than public schools is increasing (USGov 2018) and increasing demand for foreign educational curricula has resulted in the growth of international schools especially in Dubai and Abu Dhabi (Kamal, 2018).

In the Higher Education sector, the number of providers has grown from one in 1977 to more than 80 institutions that include universities, colleges, and higher education institutes, which have a total of more than 110,000 students. However, many foreign

universities with good reputations have opened overseas facilities in the UAE, for instance, American, Canadian, Australian and British. The status of these institutions varies from publicly funded to international accredited universities with quality assurance standard, locally accredited universities, and vocational and technical colleges that do not award degrees.

The Dubai International Academic City (DIAC) is a higher education, dedicated free zone, with a campus occupying 18 million square feet, advanced facilities and it houses 21 of the total of 37 foreign university facilities (USGov 2018). The UAE is the fourth most popular destination for young people wishing to gain a degree outside their native country, which adds to the complexity and to the multicultural mix in UAE higher education.

The UAE Ministry of Education introduced a new examination in July 2017, which was intended for the final year of public and private secondary school and perceived as the means to improving the educational system and allowing students to obtain an admission to a higher education course. In the UAE, higher education institutions demand different final school examination marks for entrance according to their status (MOE 2018). The subjects comprising the certification depend on whether it is a general or advanced level, with six or eight subjects respectively; Arabic, English, Physics, Chemistry, Mathematics, Biology and Computer Science for advanced, and omitting Physics and Chemistry for the general certificate.

All public and private schools that follow the UAE national curriculum must enter students, whilst private schools following another curriculum may choose to do so; Emiratis and expatriates take identical examinations. There is no pass mark for the test, but the English marks have been rated against the IELTS and the Common European Framework of Reference (CEFR) bands (MOE 2018). The rate of graduation from secondary school was 96.7% in 2016/2017 and the target to 2021 is 98% (Kamal 2018). The number of Emiratis continuing their education into the higher education sector has considerably increased from approximately 66,000 in 2011 to 80,000 in 2016 and forecast to rise by 4% annually to 2020 (Kamal 2018). This high pass rate suggests that the rigour of the curriculum may be rather low but without further evidence, represents a gap in the knowledge regarding educational standards.

Secondary school Emirati graduates are increasingly selecting foreign universities for higher level education, particularly in the UK and USA, because Emirati employers prefer graduates from international universities rather than UAE institutions. Some employers sponsor external studies in specific subjects, for instance engineering, and the UAE government bodies, and academic institutions also sponsor foreign publicly funded courses for Emiratis (Kamal, 2018). These higher educational preferences by students, employers and UAE government indicate that the skills set being acquired in UAE schools and universities continues to be a mismatch with that demanded for future growth by the Government and Business leaders, emphasising the gap that this thesis seeks to diminish.

A study conducted by O'Sullivan (2015) concentrated primarily on educational reform in the UAE and stated that the Government focus was on public schools, and that teachers and pupils in this sector were predominantly Emirati. Private schools attracted many more pupils, Emirati and non-Emirati, and some of these had a high standard. However, many were characterised by inadequate resources, but were favoured by Emiratis because they considered that their children would receive a better education.

Whilst the schools, which teach the British, and to a lesser extent the American curriculum, claimed to enable pupils to have substantially better capability in English and location, for instance, international reports such as World Economic Forum (WEF) rated UAE schools lower performers than others in the GCC region in 2012 (O' Sullivan 2015). In terms of pedagogy, the WEF (2018) global competitiveness report ranks UAE primary school enrolment rate 87th out of a total of 137, the quality of primary education 16th and higher education and training 36th, with aspects such as internet access and enrolment rates being relatively constant over five years.

In terms of pedagogy, little published research appears to exist on teaching practices in public and private schools, other than reports from the Ministry of Education. An investigation into teaching methodology in science subjects by Dickson, Kadbey and McMinn (2015) found that most teachers in both school types were expatriates, and therefore expected pupils to be encouraged to work in a collaborative manner, enquiry based learning and to include a significant proportion of practical work. If this were the case the pedagogy would align with the Government's objective of a knowledge-

based society and in a key curriculum subject to improve the associated skills set. However, Gaad's (2006) research highlights a misalignment in the education system, it shows that the teachers deliver the content without considering either the context, the quality of delivery or the national goals. In addition, teacher evaluation does not reflect the national goals. The Abu Dhabi Department of Education and Knowledge (ADEK) model teacher guide for best practice in science specifically promotes critical thinking and problem-solving skills, learning by doing not merely by being attentive in the classroom and watching demonstrations with explanations (Dickson, Kadbey & McMinn 2015).

The survey of 248 public school teachers and 66 private school teachers by Dickson, Kadbey and McMinn (2015) found diverse classroom practices, with private schools generally employing enquiry-based learning, Information and Communication Technology (ICT), and group work, which somewhat aligned with ADEK (2018a) best practice guidelines. In contrast, public school teachers were challenged by low level of English and poor classroom behaviour.

KHDH encourages teachers to focus on students being given the opportunity to give explanations regarding their behaviour, instead of being punished for unacceptable behaviour, because it proposes that children are curious. It stresses that punishment systems are too often used at home, but that punishment generates anxiety, which inhibits learning and will not foster curiosity nor the lifelong learning approach that is vital to 21st century success.

This research by Dickson, Kadbey and McMinn (2015) also found that neither public no private schools were well resourced to conduct practical work so that this aspect was not a prominent feature of the pedagogy. Public school teachers commented that they were unable to teach science by implementing the methodology they had been trained to use in their native country and, in order to conduct experiments, they bought resources from their own funds because there was no money allocated in the school budget. Teachers were not permitted to plan field trips and, if these occurred, their frequency might be once a year.

In addition, the level of English tended to be the criteria for differentiation in teaching material in the science classroom, rather than science ability. Some teachers wished to integrate science, mathematics and English to provide a more effective learning

experience for students but were unable to do so because the ADEK curriculum did not allow flexibility. Therefore, teachers felt that they lacked empowerment and trust from school management. However, the researchers commented that the number of responses from private school teachers was much lower, which infers that the findings may not represent the situation in private schools generally (Dickson, Kadbey & McMinn 2015).

This study reveals a number of important indications for this thesis, for instance that the imposed curriculum lacks the funding required to deliver it, that school administrators do not have the skills to manage teaching professionals in an appropriate manner, in other words enabling them to utilise the appropriate teaching methods and personal judgement. Hence there is a distinct possibility that objectives espoused by ADEK (2018) are not being supported in teaching practice.

2.4.3.3 Developing a New Educational Model

The UAE government has recognised that accomplishing the transition to a knowledge economy requires a different educational approach and associated skill set, which is also stressed by Sahlberg (2006). Whilst a range of strategies and frameworks for educational reform are available, the selected approach must reflect the local context, which is difficult in this case since a well-defined skill set to match 21st century workplace requirements do not exist (Bellanca & Brandt 2010). The framework for 21st century education developed by The Partnership for the 21st Century Skills (P21) was integrated with the Core Common State Standards in the United States, in an effort to merge the core academic subjects with the 4Cs, which are critical thinking, communication, collaboration and creativity; this approach is recommended by Asimail and McGuire (2015).

However little detail about how teachers are to be prepared to deliver such a curriculum is given, or of the appropriate subject content, merely that teachers must find interventions to develop such skills, by problem solving and collaborative working and that multimedia tools should be integrated into lesson plans. In addition, continuing research is proposed by Asimail and McGuire (2015) to assess the effects of such a curriculum on student social cognitive and academic capabilities. Therefore, this part of the research is of limited use to teachers, without the training or skill to be innovate in the manner described.

Any research that is likely to be valuable to creating a new educational approach that embrace the skills and knowledge required for future careers must include the perspective of business leaders, especially those employed by large companies, which have a considerable social impact, and represent the most influential and most advanced in terms of technology, innovation and market intelligence regarding future skill requirements (Holstein & Gubrium 2001).

The importance of Chief Officers and senior executives is also emphasised by Wagner (2008), in order that the processes for resolving highly complex issues are integrated into the school curriculum. The inference is that leadership skills must be integrated into the skills set the educational policy and practice aims to instil in students. Typically, complex challenges must be resolved by means of shared leadership, problem solving, shared responsibility and critical, innovative thinking, representing vital leadership skills (Jones & Brazdau 2015).

This type of leadership is referred to as conscious leadership, which results from understanding the sociocultural value of mutual knowledge exchange, vital for knowledge economy accomplishment. The value of shared leadership must be understood as being vital for accountable and responsible practice, according to Jones and Brazdau, (2015), and is also highly relevant for university level educational administrators, who are involved in developing curricula and pedagogy.

A complementary definition of conscious leadership, which is relevant to the business and educational context is that it is deliberate and embraces the long term and short-term leadership factors (van Niekerk & van Niekerk 2013). A model demonstrating the short- and long-term features of conscious leadership was devised by evaluating a range of leadership theories. Short term conscious leadership comprised of three aspects; features of leader, followers and situation. The conscious leader considers all three aspects in his/her leadership strategies, in order to provide good leadership. S/he establishes the perspective of employees and others on which a situation impacts, is people and task orientated, creates a suitable value system, is experienced and trusted.

The employees must be ready to take responsibility, because they would be required to participate in decision making, to support the vision for the organisation and the objectives set for it, and to possess the motivation, knowledge and experience to achieve excellence. Achieving this situation relied on the organisational culture,

which enabled followers to achieve excellence and was, therefore, reliant on how effectively working groups and teams operated together. The additional situational factors were the time available to achieve the goals, the rapport between leader and followers, how appropriately the task is structured and its specific characteristics, as well as the extent of power held by the leader.

Short term leadership was considered inseparable from the long term it generated, which comprised articulation of the organisational vision and goals, managing values and priorities to allow employees to attain optimum performance, supported by training and developing and empowering them (van Niekerk & van Niekerk 2013). Other leadership models have some similar features and, whereas learning and development is vital to innovation and continuous learning, formal training and development may be perceived as indoctrination and restrict rather than serve to achieve the required learning and innovation (Schein 1991; Stacey 2010).

The inference for educational policy and practice is that business leaders' input is crucial and that the concept of conscious leadership has important characteristics for guiding the educational and related skills set changes in UAE educational models. However, other leadership models adopted by business leaders should be evaluated, in order to access a broad perspective on 21st century skills and knowledge required by future business, government and educational leaders and employees and in the UAE context, and relevant to Emiratis. In the Methodology chapter leadership in relation to interviewee criteria will be discussed.

2.4.3.4 New UAE School Education Curriculum

The UAE Vision 2021 and UAE National Agenda (UAE 2010) focus on national matters that are relevant to this thesis, specifically the economy, education, infrastructure and government services. Education is stated to be particularly important to the National Agenda such that eight major objectives were devised to enable the next phase of UAE educational development to take place and included an ambitious goal of becoming a world class education provider.

The UAE has the specific target of being ranked in the top 20 PISA nations and in the highest fifteen in Trends in International Mathematics and Science Study (TIMSS), and it aimed to have the highest quality teachers in all public sector schools, as well as

school led by effective school leaders. The goals for Emirati students included accomplishing high skills in the Arabic language to enable 90% of them to accomplish grade 9 in the National Assessment Programme, 90% would complete upper secondary education, no student would need to attend the university foundation programme, and 95% of children would attend pre-primary education.

The Agenda specifically mentions ambitions for Emiratis, which include enabling them to make a valuable contribution to the nation, and that almost all should experience higher education. This would allow them to become senior respected industrial leaders and entrepreneurs, whilst others would be developed as senior public officials that would continue to drive change and economic sustainability. Inclusion and innovation were integrated into the vision, specifically that UAE aimed to ensure success of all groups of students by 2020, free of barriers and promoting rights of all, and that UAE would be ranked as a highly innovative nation by 2021 (UAE 2010; RWA 2012; Warner & Burton 2017). A reading law was passed in the UAE in 2016, in an effort to change the culture of reading (Warner & Burton 2017), since PISA outcomes indicated insufficient change.

A report by Raffles World Academy (RWA c. 2012) provides details of the types of educational targets required by the UAE Ministry of Education and the strategies planned to accomplish them. The Government had adopted a variety of standard international and national tests beyond PISA and TIMSS, in order to benchmark its performance against global standards, for instance progress tests in English, mathematics and science from grade 1 upwards, cognitive ability from grade 2 onwards and a national test in Arabic for grade 4 and above. Its targets for PISA set by RWA (c. 2012), were stated as table 8.

Table 8: Targets for PISA to 2021

Score	Mathematics	Reading	Science
2012	514	504	497
2015 target	534	529	522
2018 target	554	549	547

Source: Author adaptation of RWA (c., 2012)

The school curriculum was changed to align with content and skills on which PISA and TIMSS assessments were based, and learning ladders adjusted to threshold concepts so that major learning aims could be accomplished (RWA c. 2012): threshold concepts fundamentally change thinking modes (Meyer & Land 2003). At primary school level, science outcomes were mapped so that all planned aspects were taught; improved balance of the four science subjects was implemented at all school levels. Daily mental arithmetic sessions were instigated as well as problem solving based on real life issues and a guided reading programme was designed for primary and secondary levels so that a reading for pleasure culture could be encouraged. Substantial focus on Arabic language comprised: new curricula with requirements specified by the Ministry of Education; wider range of learning strategies and more highly qualified staff to teach the language; remedial lessons; Arabic week and regular Arabic cultural activities; team teaching and invitation to Arabic parents to read to students in class; competitions; UAE social studies.

Students were prepared for university at RWA (c. 2010) by taking IGCSE examinations at the end of year 9 and given support to write personal statements and applications for university.

Leadership practice was introduced at many levels, school management and student responsibilities were also structured (RWA c. 2012) and are evidently based on western standard practices. School leadership was characterised by three levels besides the headteacher, middle managers, team leaders and curriculum leaders, performance management of teachers adopting the 360-degree model, qualifications and accreditations, external moderation and training. Performance management aimed to increase teacher retention. School leaders were expected to constantly monitor teaching and learning to identify gaps, which could subsequently be improved.

In the primary school, leadership was represented by the creation of house and sports captains, eco-monitors, monitors from grade 5 level upwards, and at secondary level Head Boy, Head Girl, Prefects, Student Body, Learning Council, Student Representatives and Creativity, Activity and Service (CAS) leaders to lead projects. Anti-bullying committees were present at both levels (RWA c.2012).

The amount of change represented by this structural transformation alone and at high speed, suggests that failure is inevitable as successful cultural change is a lengthy

process requiring visible commitment by leadership at all levels, and shared vision by all concerned, according Kotter (2012).

The type of changes in curriculum design and associated pedagogy described by RWA (c.2012) were achieved by applying the principles of progressivism, in which all groups were included in education and there was a link to transforming the national economy (Warner & Burton 2017). A deep, rather than a shallow approach to progressivism was selected by UAE, in other words, students acquired information and applied it, so as to radically alter the current shape of their environment, rather than receive instruction, which reinforced the status quo (Burton 2008). The implementation of the deeper form of progressivism from 1970s was mainly led by western education policy makers and practitioners (Cohen 2010); this idea is retained in contemporary policymaking, where human capital building to transform to a knowledge economy is the goal.

Resourcing the schools with teachers, who would drive the educational reform was approached in Abu Dhabi, for instance, by recruiting expatriate English speaking teachers to deliver the science, mathematics and English curriculum in all public primary schools from 2006. The assumption was that they would use best practice teaching methods, and private schools in Abu Dhabi also adopted this approach; ADEK expected enquiry-based learning (Dickson, Kadbey & McMinn 2015).

ADEC's (2010) NSM is based on the following key elements: beliefs, approaches and learning environment. The NSM is based on the two core beliefs that all children are capable of learning and that teachers are responsible for teaching and learning. Since 2006 of the Federal Law No. (29) "Concerning the Rights of People with Special Needs" students with special needs have the right to be included in classrooms and schools. The new approaches in the NSM concern the learning environment, pedagogical approaches, partnerships and assessments.

The teacher in the NSM has to create a supportive and enabling learning environment as well as meaningful learning opportunities which encourage active student involvement. Furthermore, relationships are ought to be positive and respectful. ADEC (2011, p.8) further details the learning environment and the relationships for example:

- teacher questioning is open and responsive to student thoughts and ideas;

- classroom dialogue moves from student to student as well as teacher to student;

- meaningful learning opportunities that encourage active involvement;

- children are encouraged to explore their learning actively through creativity and problem solving;

- The learning program is flexible and emergent, based on children's interests and needs.

The pedagogy approach will be discussed in the next part of this chapter.

Healthy partnerships between teachers, community, parents, students and their peers are another central feature that will support teaching and learning. Assessment in the NSM will no longer be utilized to only determine a child's performance results but to also inform teaching and learning. Assessment information will be utilized by the teachers to determine the student's stage of development and to plan learning experiences accordingly. In order to support teachers in achieving the described outcomes, the NSM provides updated resources and a new curriculum. Resources will be upgraded both in terms of school facilities as well as classroom resources. Schools will have 'Learning Resource centres' (LRCs) to promote an integrated learning environment and extracurricular facilities to support physical and social development. Furthermore, classroom resources such as 'Information and communication technology' (ICT) will be provided. These will support students to gain knowledge and understanding through exploration and experimentation.

2.4.3.5 Tertiary Education Strategy and Interventions

The Quantity Assurance Agency for Education QAA (2017) report documents UAE Annual Economic report, which included the goals for education that are all focused on the tertiary sector. The relevant objectives are: support vocational and technical education and link its outputs to labour market needs; establish research centres and technology innovators to generate ideas and innovations and increase the number of science and technology master's and doctorate degrees; link education to development

and make it a source of research and innovation, by increasing tertiary level institutes and partnerships with international universities; encourage companies to approach universities and research centres to provide technologies; attract knowledge industries and innovation centres to new knowledge /smart cities.

The UAE had 140,000 students and 100 higher education providers but only 3% were public universities, another 71% being accredited by the Commission for Academic Accreditation. The 56 Dubai universities have approximately 60,000 students, 43% are Emiratis, and 65% of all students are enrolled on bachelor degrees. There are three public universities enrolling 10,000 students. In contrast three public universities in Ras Al-Khaimah attract 70% of students, and in Abu Dhabi, 52,000 students attended 29 higher education institutes in 2015-2016, 89% being undergraduates (QAA 2017).

The UAE introduced technical and vocational education in relation to its 2030 Framework for Action, in an attempt to encourage young people to develop these skills; this type of vocational education is recommended as vital, a core element for labour forces skills development, by global institutions but was little emphasised in UAE until recently. It is now promoted in all seven Emirates (Esposito, El-Sholkamy & Fischbach 2017) and is an option for students who do not progress their school education after year 10, a further two years is spent learning trade skills (Pennington 2017).

An example is the Abu Dhabi Centre for Technical and Vocational Education and Training (ACTVET), which is government funded and accredited, and has 31 campuses, which are located at secondary schools. Alternatively, they are separate technical schools that have the purpose of teaching trade skills and of awarding certification. Students learn the STEM skills, Arabic, communications and technology and may select additional options including engineering and aviation maintenance and business. The focus is on application of theory and readiness for work skills, although they may choose to study for a degree first. In addition, 19 post-secondary institutions exist offering advanced educational and vocational training courses (Pennington 2017). Another is ADVETI, formed in 2007 exclusively for Emiratis, and its focus is on service industries and purpose to diminish reliance on expatriate labour in UAE; it is regarded as the most successful in UAE (Al Hammadi & Mohiuddin 2018).

2.4.3.6 Pedagogy

The pedagogy implemented to accomplish the UAE 2021 educational vision is described by the interpretation of one private school RWA (c.2012) as: personalised learning so that each student could fulfil his/her potential; learning and using questions to enhance critical thinking by means of Bloom's methodological approach; diverse assessments including a formative guided learning test to identify base level, standardised assessments including TIMMS and other tests to enable student familiarity with their style; model lessons devised by outstanding teachers, sharing best practice and ensuring that middle leaders were accountable. At primary level greater use of the science laboratory to generate a culture of enquiry-based learning.

The descriptions provided by RWA (c.2012) are particularly useful because they are provided by a school, which has interpreted the national curriculum and how it was to be implemented so that the school could align with the strategies developed by the UAE government and the Ministry of Education, which had made the decisions about appropriate pedagogy to drives its goal of a knowledge economy.

Learning resources were enhanced, especially in science to enable "powerful investigations" (RWA c. 2012, p. 13), support staff for students with special needs or language support, electronic resources including e-reading at primary levels, and a range of technological devices at secondary level aimed at encouraging better technological integration. There are no official review projects since the launch in 2010 however ADEC (2011) states that there has been review processes undertaken. As stated, the researcher has studied the handbooks and material regarding the NSM, and this is a summary of the pedagogy:

NSM is an interactive method in order for students to become independent problem-solvers and thinkers. To achieve this, teachers are to apply a specific 'gradual release approach'. This approach is adjusted to the specific subject since each subject requires different types of thinking.

Figure 14: The gradual release approach

Gradual Release Model

TO/FOR learners   WITH learners   BY learners

Teacher support

| MODEL | SHARE | GUIDE | APPLY |
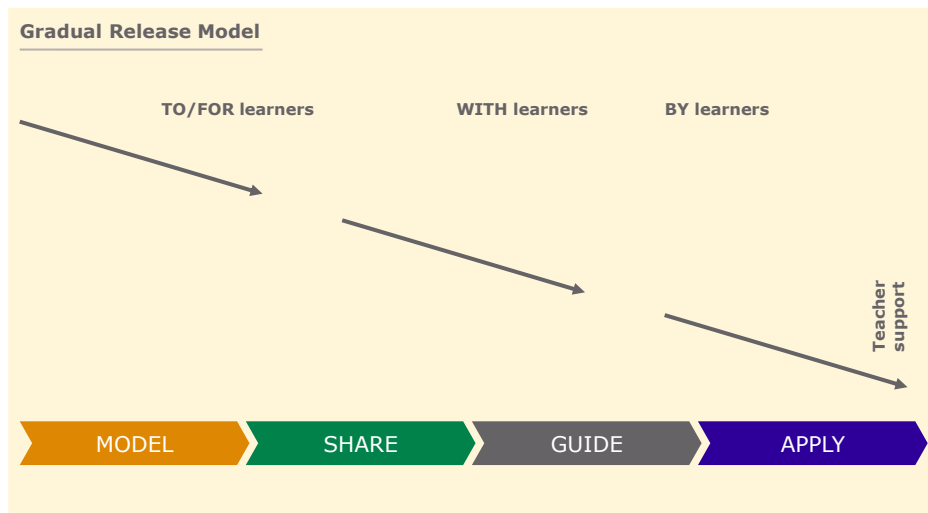
A 'student centred teaching process' is used, which is a seven-step planning and delivering instruction approach which is centred on student learning. The seven steps in the process, for the teacher to follow, are according to ADEC (2011): observe students; predict present stage of development; compare student progress against learning outcomes; identify student learning needs; plan and select resources; teach; observe, assess and reflect.

In ADVETI the pedagogical approach to vocational and technical education is to observe students as they develop their technical skills and to also focus on communication skills required for the working environment, so that English language skills are considered vital. Students also have the opportunity to experience work placement and/or an internship in a national or an international company, with some of those in France or United Kingdom (Al Hammadi & Mohiuddin 2018).

2.4.3.7 Outcomes from New Educational Policy and Practice

The progress of the UAE educational strategy towards its published goals is the subjects of a number of studies, internally produced and often endorsed by a senior official and those independently researched.

The UAE's PISA performance against its PISA goals, which are relevant to school performance, were reported by OECD (2018). The UAE was rated 48th globally, the same ranking as in 2012 (OECD 2014). Its United Nations Human Development Index (UNHDI) rating in 2018 was 34th with a score of 0.863 UN (2019) compared with the top country Norway with a score of 0.953; Norway and UAE have very similar per capita GDP but expected and mean years of schooling in Norway are 17.9 and 12.4 respectively compared with 13.6 and 10.8 in UAE. The UAE's PISA scores for three subject areas in 2012 and 2015 are compared with the targets set by the RWA (c.2102) in table 9:

Table 9: UAE PISA Outcomes

Score	Mathematics		Reading		Science	
	Target (RWA)	UAE Actual	Target (RWA)	UAE Actual	Target (RWA)	UAE Actual
2012	514	434	504	442	497	434
2015	534	427	529	434	547	427
2018	554		549		522	

Source: Author adaptations of (OECD 2014; OECD 2018b; RWA c. 2012)

In 2012, the UAE share of top and lowest performers in mathematics were 3.5% and 46.3%, whilst in 2015, the UAE share of top performers in at least one subject was 5.8%, and of the lowest performers in at least one subject was 31.3% (OECD 2018b); lowest performers are ranked at levels 1 and 2 and highest at levels 5 and 6 (OECD 2018b).

Whilst extensive effort has been made to locate both the original UAE targets and the individual results of a well-respected private school, RWA, data are not provided even in official government inspection reports or the RWA school website. The inference from table 9 is that RWA sets its targets much higher than national targets and that

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maybe a reflection of its achievement about these average scores, but there is no evidence to verify this assumption.

However, Warner and Burton (2017) state that progress towards UAE goals was highest in the private school sector, which achieved average or above average PISA scores in 2015 but was below the OECD average in mathematics; UAE also scores well below the average in science (OECD 2017b). The comment made by Warner and Burton (2017, p.19) regarding the potential for UAE to accomplish its 2021 goals for PISA was most likely to be a "well-paced jog than a sprint." Still, as stated earlier the NSM students will participate in the PISA study 2018 and the results are published in December 2019.

The OECD (2017b) discussion of the 2015 Pisa outcomes, commented that UAE is one of just 5 nations in which more than 50% of the school week is spent on core subjects, and a minimum of 54 hours per week, in school and outside of it, on school related activities. This data was compared to 40 hours in Finland, Germany and Switzerland, in which total learning time and academic performance was considered to be most balanced (OECD 2017b). In other words, OECD (2017b) explicitly states that a high number of learning hours does not correlate with outcomes and shows that overall the UAE has the largest proportion of learning time ratio to available time.

The relatively low relationship of learning hours to outcomes could be accounted for in several ways, according to OECD (2017b), for instance: as an indication of the relative efficiency of the education system; the fact that in some education systems students needed to spend more time on planned learning for a specific purpose, because they had little opportunity for information learning outside school, for instance with family or knowledgeable contacts. Naturally in the case of this thesis, more contacts with business leaders and knowledgeable employees is considered to be a possible strategy for both improving the efficiency of the education system, and for providing opportunities for informal and applying learning in a real work context. However as discussed earlier Mohammed and Morris (2019) highlights that the current PISA tests are made by the above-mentioned countries and for their students, hence results should be analysed with caution.

A review of UAE's progress towards its educational goals, generated by research at Mohammed Bin Rashid School of Government, by Warner and Burton (2017) found

that school inspection frameworks remain inadequate, because they concentrate solely on standardised test results in mathematics, science and reading, and ignore the business discipline, as well as humanities and the Arts. Therefore, appropriate evaluation of skill set development is neglected, critical thinking, problem solving, and life skills required for the knowledge economy (Warner & Burton 2017).

Whilst private education represents the major part of the UAE educational provision, it is market driven, the business model is profit focused and tends to attract teachers and administrators that are vital for target accomplishment. As a consequence, teacher quality is associated with educational outcomes in the UAE, and a holistic approach to teaching and learning is more likely. However, Warner and Burton (2017) note that the public sector school system is failing to generate the required educational outcomes because teachers employ traditional pedagogies of rote learning and memorising facts.

All teachers employed in the UAE are expected to attain equivalent professional standards, but the public-school sector is typified by lower qualified teachers. A teacher licensing system was proposed in 2014 but was not implemented, however, in 2016 a five-year plan to implement a licensing scheme was announced, with the purpose of a bachelor's degree being the minimum teaching qualification.

The introduction of the new curriculum in 2016 stimulated the Ministry of Education to implement a plan to train 10,000 public school teachers by 2020, and to have 90% Emiratis in public sector education.

The study by Dickson, Kadbey and McMinn (2015) suggests that lack of resources for enquiry-based science teaching based on individual/group practical work in both private and public schools was a challenge; this may explain low PISA performance in science. Low English competence and behaviour management were other challenges for teachers in primary schools (Dickson, Kadbey & McMinn 2015).

The UAE higher education sector has failed to attract as many children of expatriates as was intended, because the majority prefer to apply for tertiary education in their home country, allegedly owing to the lack of confidence in the UAE system. This factor has reduced UAE position in the World Economic Forum (WEF) competitive ranking (Warner & Burton 2017) and has negative inferences for the knowledge

economy goal in terms of opportunities for Emirati students to informally learn critical skills at tertiary level by interaction with non-Emiratis. This finding also suggests a gap in the knowledge of how the absence of the children of expatriates impacts on business leaders to engage with UAE universities and Emirati students.

In both Abu Dhabi and Dubai, university student numbers have increased over the past five years, mostly because more Emirati and public sector employees have chosen to remain in education to the tertiary level (QAA 2017). The number of students attending Activet courses has increased from 2500 Emiratis in 2005 to 15,000 by 2017 and another campus was planned to enable 5000 more places in the coming months; the initiative was stated to have increased closer working with UAE private sector companies (Pennington 2017).

AVENTI reinforces these developments and states that 4712 students were learning in the 8 UAE vocational centres, comprising technical vocational institutes, in which 1922 students had enrolled, almost equal male and female students, whilst 1862 were studying in secondary technical schools and comprising 1087 males and 739 females but the Vocational Education Development Centre had 928 male students. Since 2007, 7321 students have graduated from the courses (Al Hammadi & Mohiuddin 2018).

2.4.3.8 Challenges to Meeting UAE Educational Targets

The literature related to the challenges to meeting educational targets is established from an educational and a cultural perspective. Whilst there are a range of challenges in both the school and higher education sector, the underlying theme is almost always associated with culture, which even recent studies continue to reveal.

As discussed earlier, Haque (2007) explains that religion is the most important variable in Emirati students' lives. The imported educational models and its targets are not reflecting the same and this might cause conflicts and is a challenge for the GEI. Also, as mentioned before, adapting imported policies is an additional challenge due to the research gap regarding Emirati culture. As discussed in detail above there are societal level differences, for example, Muslim cultures being collectivistic as opposed to individualistic in the west, which will be reflected in the policies and specifically in the hidden curriculum. Therefore, as the study shows there is a need of knowledge of own culture and religion as well as "become familiar with philosophies

leading to the western culture and the dangers inherent in them" (Haque 2007, p. 8). Furthermore, the lack of Emirati teachers in the public-school system is a considerable issue, The National (2015) reported that only 396 Emiratis worked in Abu Dhabi's Department of Education and Knowledge (ADEK), the UAE's public education sector, most of these were female administrators and some classroom teachers. However, out of 98 Emirati men who joined the department in 2014, only 24 were teachers. The issue was that male Emiratis did not consider teaching as an honourable or worthy profession for a man, and ADEK had launched an initiative to recruit more men as male role models, which were lacking in the public-school classroom. This continues to be a challenge (ADEK 2018b). The quality of Arab school leadership is an additional factor, since it has traditionally been an administrative role without accountability for educational outcomes (Barber, Mourshed & Whelan 2007).

Educational changes are not progressing at the forecast rate, which is evident from the PISA outcomes, all schools especially public schools remain below the OECD average. The reason for this suggested by Cuban (2013), is that UAE education policy and pedagogy is not based on local pedagogical methods, decisions are made without including the teachers who must implement them. Instead, educational reform is a political, public debate between key stakeholders, and teachers may not embrace the change because the teacher centred approach is hard to dislodge, and new curricular frameworks neither substantially alter the content or the skills employed by the teacher in the classroom.

This is very relevant to UAE specific pedagogic challenges according to Al Ateeqi (2009), who stresses the culture of rote learning and memorising facts. This issue represents both national cultural differences in pedagogy and an institutional culture of top down decision making and strategy that others must implement. The issue for this thesis is that most leaders in Arab countries have been educated in Western countries and are likely to have been influenced by their experiences overseas (Kamal 2018), which may have led to decisions to employ western educational specialists to support educational reform.

The lack of consultation of Arabic school leaders and teachers regarding the reforms is, however, likely to result from the cultural norm that leadership is centralised (Branine 2011). The means to a more successful outcome was to consider different

aspects of the national culture and to assess their impact on the people who implement strategies, according to Savolainen (2007). However, a survey of teachers by Tabari (2014) suggested that culture was not the fundamental issue, rather the lack of involvement in decision making, that the resources provided were unsatisfactory, and that teachers were asked to conduct too many projects at once. There were also very few opportunities for teachers to meet and to share experiences, but critically that the meaning of the reforms and their objectives had never been explained to those expected to implement them.

This issue of lack of attention to local UAE pedagogical preferences is also illustrated by the fact that there has never been a tradition of teaching behavioural skills in UAE, but the western and northern based education models incorporate western values and cultures, which will not necessarily align with UAE norm.

A survey conducted by Warner and Burton (2017) found that the major perceptions of why the UAE was not meeting its educational goals were that: turnover of educational leaders was too high; it was not sufficient to have top leadership positions dominated by expatriates although their contribution was recognised as necessary; there were too few qualified and experienced Emirati faculty continuously involved in educational development; more investment was needed in education; parents were not sufficiently involved; classroom teachers were the major intervention to ensure change. These challenges may also relate to hierarchical decision making in government, which was highly influenced by the ideas of predominantly western educationalists (Warner & Burton 2017).

In terms of pedagogy, the type of testing that had been predominant is norm related, how well one student completes a task compared with another, whereas criterion reference tests are based on competency in specific skills (Reigeluth & Karnopp 2014). In the UAE testing in schools is based on norm related aspects of learning, and testing is also individualised, so that implementing an educational approach that intends students to gain the skills to conduct collaborative learning, but fails to assess the level of those skills, appears irrational (Robert & Roland 1988) and may also have some impact on unaccomplished outcomes.

Whilst there has been significant emphasis on preparing Emiratis and other students for university entrance, a major weakness is the lack of attention to the alternative of

vocational education in UAE, referred to as Technical and Vocational Educational Training (TVET). In addition, Emiratis receive free university education in State owned universities, which increases their attractiveness.

However, the industry 4.0 technologies, for instance robotics, smart manufacturing and internet of things, required employees with technical and vocational skills. An associated challenge existing in the TVET sector of tertiary education is the low student numbers compared with degree courses (Al Hammadi & Mohiuddin 2018). This may be a consequence of cultural ideas about vocational education as second choice, but also be part of a western based hidden curriculum, in which the same perspective tends to exist and is likely to be communicated in schools (Cedepof 2008). There is no mention of industry (Al Hammadi & Mohiuddin 2018) leaders participating in curriculum development at AVENTI nor is the source of training staff revealed, other than they are recruited with rigour.

In the university sector, there were tensions between teaching and research, with research being a fundamental need to realise the knowledge economy, but studies of private universities revealed that that teaching load was very large because of the financial need to survive, and research was almost non-existent (O' Sullivan 2015); funding for research was not easily accessible, which was explained by Hivdt (2015) in terms of the low allocation of funds by Government and culture of the university as a teaching institution.

Lecturer turnover was also reducing the capacity for quality education, because contracts were often for two to three years, and a lack of academic freedom deterred staff retention. The university accreditation agencies, government bodies and internal powerful departments such as finance or short-term consultants also competed for authority; they all had different goals and helping the student to be productive in the economy was not their priority.

The range of studies focus on a variety of challenges to meeting the UAE knowledge economy goals, and most are not quickly resolvable, the business of education appears to have taken priority over its quality and adequate resourcing in some cases, at least. This means that knowledge industries are likely to continue to experience skills shortages and young Emiratis will not be prepared for knowledge work in the way that the educational reforms intended. The contribution that business leaders

could make to resolving the challenges is a gap in the knowledge, because of they have so far been excluded from any policy and practice matters.

2.4.3.9 Labour Market Perceptions of Challenges in UAE Education Policy

A very recent report on the future of work in the UAE by Esposito, El-Sholkamy and Fischbach (2017) emphasises that the current education system is not generating the skills required for a UAE labour market focused on knowledge economy industries. It states that many studies have found that most employers believe that the current education system fails to equip young people with the skills, attitudes and training, which are required in the workplace. The report also makes the link between this comment by business leaders and the UAE's below average PISA outcomes in the STEM subjects, stating that the 2015 science score of 427 was far below the OECD average of 493. This has occurred despite the UAE investing significantly in innovative teaching and learning methodology across the curriculum.

Student satisfaction is stated as being correlated with positive attitudes to the labour market, but that insufficient action is being taken to develop STEM skills and then to encourage young people with those skills to opt for employment in which STEM skills are vital, knowledge industry jobs (Esposito, El-Sholkamy & Fischbach 2017). Digital literacy skills are particularly lacking in the knowledge industries and employers are concerned about the potential relative failure of the education system to provide sufficient future employees, unless there is insufficient focus on ICT technologies within the curriculum, supported by workplace training and retraining. The Emirati population skills are stated to be weak in the Industry 4.0 technologies, such as AI and use of Big Data, associated with decision making and problem solving (Esposito, El-Sholkamy & Fischbach 2017) but no comment is made as to whether the school curriculum introduces such concepts, which are a concern to knowledge industry employers.

The new education system and its commitment to equal participation of Emirati women, appear to have significantly improved the skills of female students but has not led to them being able to find employment (Esposito, ElSholkamy & Fischbach 2017); forecasts show that more women in the labour force would increase UAE GDP by 12%. However, the report suggests that legislation protecting women in private firms is relatively weak. This is equally important to future employment prospects of

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women because jobs they traditionally occupy are disappearing and replaced by technology; in 2016, only 4.8% of employees in scientific, technical and professional jobs were women (Esposito, El-Sholkamy & Fischbach 2017).

A survey of 19,869 Arab online users, of which 7% were UAE nationals, found that they had strong opinions about what governments should do about skills, education and research, with 74% stating that skills should be expanded. The specified skills expansion was suggested as programming, coding, applied mathematics and data management to support move to digital economy. The survey found that 72% of participants stated that children's education curricula should promote digital technologies and the same skills, and 52% that more general and educational Arabic content should be available online (Salem 2017). Although this survey was conducted in 22 Arab countries these outcomes are interesting because they align with Esposito, El-Sholkamy and Fischbach (2017) about the need for digital technologies to be integrated into the school curriculum. Additionally, it suggests one reason why schools are not reaching as high as standard in Arabic studies as might be expected, because pupils access digital devices and the internet in the digital age but fail to find sufficient Arabic content.

2.5 Situating the Current Study

Table 10 is showing the key findings from similar studies and how they are related to the sub research questions.

Table 10: Key Findings of Previous Studies

Research Sub question	SQ1: Which skills, knowledge and behaviours are required in UAE's transition to, and continuing development of, a knowledge-based economy?
Key findings previous studies	**BC (2018)** • STEM skills and comprehension of English are the foundation of future jobs, • Complex problem solving, critical thinking, creativity, people management and coordinating with others were identified as priority skills by Business Leaders in the UAE, • Personal skills such as coordinating with others and strong command of the English language reflect UAE's economic model of a regional business and trade hub.
Research Sub question	SQ2: What is the precise nature of the gap between the skills, knowledge and behaviours of both the Emirati and Expat work force and that required in the UAE knowledge economy?
Key findings previous studies	**Eposito, El-Sholkamy, & Fischbach (2017)** • Public sector remains the largest UAE employer, benefits are a substantial attraction, so that most Emiratis prefer working in this sector rather than for private companies, • Potential high value jobs could be significant in STEM areas whereas these skills are weak among Emiratis. **BC (2018)** • UAE graduates lack both STEM skills as well as essential skills such as complex problem solving, critical thinking, creativity, communication and collaborating with others and command of the English language, • Emiratis have a continued preference for public sector employment and their incapacity to compete in the private sector because of their skills gap

Research Sub question	SQ3: What challenges & opportunities exist to enabling education to contribute effectively to UAE's transition to a knowledge economy?
Key findings previous studies	**Siddiqi et al. (2016)** • Technological innovation and scientific wealth of a country are a key driver for economic growth and competitiveness, • Low research levels and low productivity of UAE based research, • Several barriers exist to improve innovation and research e.g. attract quality faculty staff, career prospect, poor school education in science and mathematics, lack of incentives to publish research. **Kamal (2018)** • Emirati graduates are increasingly selecting foreign universities for higher level education, due to better employability, • High pass rate to higher education suggests that the rigour of the curriculum is rather low. **Eposito, El-Sholkamy, & Fischbach (2017)** • Private sector employers consider that the UAE education system fails to instil the required skills, attitudes and training for the workplace, • Vocational education is recommended as vital, a core element for labour forces skills development however seen as a second best options for Emiratis, • Integration of women into the workforce requires broad structural changes and policy reforms, • Additional resources need to be made available for research in order to sustain the UAE's competitiveness, • ICT and digital literacy need to be expanded outside education and into the workplace reflecting the need for lifelong learning.. **Warner and Burton (2017)** • School inspection frameworks remain inadequate, due to their focus on standardized tests in mathematics, science and reading, and ignoring the business discipline, as well as humanities and the Arts, • Efforts to develop students with problem solving, critical thinking and life skills required in a knowledge economy need to be evaluated as well, • Major perceptions why educational goals in the UAE are not being met include teachers employ traditional pedagogies of rote learning and memorising facts, high turnover of educational leaders, too few qualified and experienced Emirati faculty., **Tabari (2014)**

	• Teachers play a crucial role in the implementation of large-scale educational reforms, • Teachers resistance to implement change is not primarily due to the adaptation of Western policies to a local cultural context but resulted from practical and professional concerns • Specifically, the lack of involvement in decision making, the unsatisfactory resources provided, and the request to conduct too many projects at once were mentioned. • Teacher highlighted the limited opportunities to meet and to share experiences, but critically that the meaning of the reforms and their objectives had never been explained to those expected to implement them.
Research Sub question	SQ4: What is the involvement of Business Leaders in influencing UAE Government and Universities to ensure that curriculum design and outcomes meet future labour market needs
Key findings previous studies	**BC (2018)** • Employers, educational authorities and institutions should be collaborating and regularly exchanging ideas on developing the skills needed in the UAE knowledge economy • Ministry of Education had provided no platform for linking educational policy makers and providers with employers so that no strategy existed for developing the required skills for knowledge workers during the formal educational system • Private Sector needs to be involved in defining the curriculum and become part of the education cycle.

The UAE Government has created private public partnership, developed and implemented policies to encourage industrial focus on knowledge industries, innovation initiatives and research and development. It has also shown its visible commitment by implementing digital technologies and Artificial Intelligence, for instance, in public sector bodies such as the Police. However, there is little evidence in any of the official reports or academic studies that it has involved industry leaders in school curriculum design and delivery.

This gap is especially evident as the BC (2018) report, for example, highlights a range of areas in which skills gaps that could be diminished by integration into the curriculum; digital competence, continues to be one of these concerns as highlighted by Esposito, El-Sholkamy and Fischbach (2017) and Salem (2017). The skills required for the accomplishment of the UAE Knowledge economy were suggested by UAE leaders in the BC (2018) survey and studies conducted outside the UAE have also indicated the nature of the more crucial skills required by knowledge workers.

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However, Schoning and Witcomb (2017) noted that identity of the most important skills changes over time, so that this study aims to establish the current perception of UAE business leaders regarding the labour market skills required for the knowledge economy.

A cultural gap remains in the type of employment that Emiratis prefer with 60% of employed nationals working in the public sector in Abu Dhabi and 55.5% in Dubai, whilst the private sector is dominated by expatriate workers. This trend suggests that there is a further case for business leaders to be involved in the design and delivery of education, both to establish interventions that will encourage Emiratis to change their opinion of private industry by gaining confidence that they have the skills to participate and to create opportunities for them to apply these skills early. This may include organisations participating in curriculum practice at school level in some way.

In a complementary context, the requirement of the UAE to quickly develop its economy has resulted in 85% of the population being foreigners (Cervik 2011), so that most UAE organisations adopt a range of western practices with little adaptation to the local culture which might be frustrating for Emiratis (Abu-Doleh 1996; Al-Azemi 2000 in Weir 2005). This situation is also a challenge to learning for Emiratis seeking employment in the private sector as well as for employers, since Schwartz (2007, p.12) argues that misunderstanding and miscommunication resulting from cultural diversity could inhibit knowledge transfer; in the UAE case, this would slow the transformation to the knowledge economy.

This factor is also stressed by Weir and Hutchings (2005), who state that the general adoption of Nonaka and Takeuchi's (1995) knowledge transfer model is also flawed, since it is based on Japanese culture. The Literature Review has demonstrated that Emiratis have a specific work culture which also pervades their integrated personal life, so that the involvement of Emirati business leaders with their expatriate counterparts, is an important aspect of this thesis as a means to accomplishing a holistic appreciation of the skill set required and how it can be achieved.

The PISA tests alone imply that whilst the reforms should theoretically provide the expected outcomes, teaching resources and enquiry led methodologies are not available in many schools. Therefore, this study intends to gain further evidence

regarding the progress made towards a knowledge economy from the business leader perspective.

The gap that remains can be partly diminished by establishing how much impact the new educational reforms have had on Emirati skill sets, attitudes and willingness to work in the private sector, from the employer viewpoint. The business leaders may also be able to identify the critical success factors required in the education system to improve performance output.

In relation to the labour market, the opportunities and challenges that business leaders perceive for employing Emiratis and expatriates currently are not known. In other words, the extent to which educational reforms have supported labour market needs, and what interventions could be implemented to improve current skills performance. This is particularly important as research has suggested that employers may not regard training employees as their responsibility because of the risk of employee attrition (Levy & Murnane 2004). Therefore, the impact of the reforms of skills available in the labour market will be investigated in this research.

The literature review shows that in the Arab world, the social structure means that individuals have extensive tacit knowledge but knowledge transfer occurs in a different way because individuals may act in an authoritarian and a consultative manner, and do not segment professional and personal life; their confidence in knowledge also depends on the perceived authority of the knowledge giver. As the literature also show a gap in research in this area this study will look into the same. The tendency for institutions to depend on foreign solutions to a local problem without understanding the strength of the deeply rooted societal norms is emphasised by Hofstede (2001) and means that employing those solutions restricts the country's development; mutual understanding and exchange of cultures provides a better outcome.

Several consequences relevant to the school and employment situation can be deduced, firstly that Arab school leaders and teachers may have little confidence in those who expound the western educational policies and pedagogies. This lack of confidence could extend to Emirati students in the classroom environment, in which there is miscommunication owing to different cultural values, particularly owing to the lack of Emirati role models in the classroom, and students' cultural conflict with

the hidden curriculum relating to how and what is taught (Jackson 1968). In the business context, the aspect of Arab work culture that lead to cooperation is the Islamic work ethic or principles stated in the Quran, the Prophet Muhammad's (PBUH) prescriptions, which are followed in business and family contexts in Islamic countries (Ali 1996), and need to be considered, as implied earlier.

Leaders of public and private business in the UAE complain about the skills of their workers (Playfoot 2009) but this Literature Review has found little evidence of collaboration of leaders with the UAE governmental education policy makers and Peters (2003a) stresses that discussion needs to take place about how educational policies and practices can produce the required labour market skills; parallel thinking and capacity to visualise the issues from multiples perspectives. This research will focus strongly on gathering the ideas that business leaders have generated regarding how government and educationalists could collaborate with them to accomplish the specific higher education performance outcomes, for instance in science, mathematics and technologies.

In addition, there has been little evidence of universities and companies collaborating on innovative research, in fact the academic studies emphasise the low government research budgets, the culture of teaching universities and low output of scientific papers and patterns (Hvidt 2015). The vocational institutions also appear to be isolated from the employers in the labour market, which they are training young people to enter (Al Hammadi & Mohiuddin 2018). Therefore, this research will also establish the extent to which business leaders have collaborated and/or continue to collaborate with government and educationalist at each level of the education system. The research will also explore how business leaders think they could further contribute to accomplishing the theoretical knowledge and practical skills of schools, universities, research and vocational education outcomes in order for the UAE to transform to a knowledge economy.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Chapter Overview

This Research Methodology Chapter appraises the research methodologies that will be employed to answer the research problem, indicates the chosen options and justifies the reasons for their selection. In order to ensure a systematic approach to presenting the methodology in a logical sequence, the research onion devised by Saunders, Lewis and Thornhill (2009, p.108) is employed.

The fundamental aspect of selecting methodologies to answer the research question is to consider the fundamental research paradigm, which may derive from taking an objective stance or a subjective stance to the research, or a combination of both (Collis & Hussey 2014; Krauss 2005). The decision made regarding the paradigm, sets the direction of the research philosophy and associated research design, which direct the nature of all other methods; the researcher commences with decisions on the philosophy and subsequently all other aspects (Saunders, Lewis & Thornhill 2015). Therefore, in this Chapter, once the research design/philosophy has been argued as the most suitable on the basis of phenomenon studied (Creswell & Creswell 2018), the relevance of the approach can be determined as theory testing deduction or theory building induction or the integrated method. A range of strategies are available for investigating the phenomenon, the most suitable aligning with the fundamental philosophy and the research environment, generally it is relatively easy to identify the most appropriate research strategy because every option has specific application. The selection of each of these methods is dependent on the nature of the research problem and therefore its choice is explained in terms of its suitability.

3.2 Research Approach

The paradigm or model chosen to answer the research question is determined by the researcher, and traditionally this has been one of two options, the objective and the subjective, which are totally different. In recent years, however, research experts have considered that combinations of the two in a variety of proportions, provide a more holistic perception of the phenomenon studied (Collis & Hussey 2014). Combing the nature of the role of the education questions and the nature of the needed skill set question, this research will take a mixed method approach. The objective paradigm

suggests that objects are a part of the external world, that they exist independently of social actors, and that information received is accurate and reliable (Groenwold 2004) as the nature of the required skill-set questions. The subjective stance is associated with phenomenology, in other words how the phenomenon is experienced by the observer, his/her conscious experience and therefore a personal view (Smith 2018) as the role of education from a business leader perspective. Phenomenology concerns a consideration of what significance objects, events, instruments, the passage of time, and the attributes of the individual and others, have to the individual (Smith 2018). It is therefore a reflection on the business leaders real-life experience so that the phenomenology here evaluates how each business leader understands UAE's transition and the role of education and the required skill-set (Manen & Adams 2010).

Each stance has a different set of assumptions, referred to as epistemology, ontology and axiology. Epistemology is the assumption made about the acceptable sources of knowledge (Carter & Little 2007), in the objective stance there is only one source of knowledge, which involves a logical transfer mechanism, that occurs, for example, when an expert instructs another (Erhaut 1994) or comparison is made with an established theory (Saunders, Lewis and Thornhill 2015). In contrast, the subjective stance to the theory of knowledge is that there are multiple sources of knowledge, ways of explaining the same phenomenon, because knowledge is developed by human perception, which is influenced by each individual's lifetime experiences (Ritchie & Lewis, 2010); this means that knowledge is transferable in many ways. Hence the objective stance tends to consider factual data and focuses on discovering cause and effect links between variables as the needed skill-set focus, but the subjective stance relies on how diverse individuals interpret it as the role of education focus, which means that research methods experts often conflict about the nature of acceptable knowledge. The ontological assumption relates to the perception of how the world works, what represents reality, the objective stance proposes that there is a single reality represented by an object or an idea, whilst the subjective stance emphasises multiple realities concerning how knowledge is acquired (Saunders, Lewis & Thornhill 2015). Axiology is associated with the values on which the research is based, the objective stance assumes that the researcher and the phenomenon are

independent and therefore, s/he has no influence on the outcomes. However, the researcher participates in the research according to the subjective stance, meaning that it is value laden. The axiological assumption that the researcher could be independent of the research is unrealistic, according to Creswell and Creswell (2018), still this research has attempted to avoid bias, and this will be further discussed in 3.7 and 3.8. These diverse assumptions, therefore, indicate that the research design will be quite different for each stance as Carter and Little (2007) indicate the epistemology dictates the method and hence the manner in which data is gathered. The relationship between the research paradigm, and the associated acceptable source of knowledge, data collection and analysis are represented by figure 15.

Figure 15: Link Between Stance and Methodology
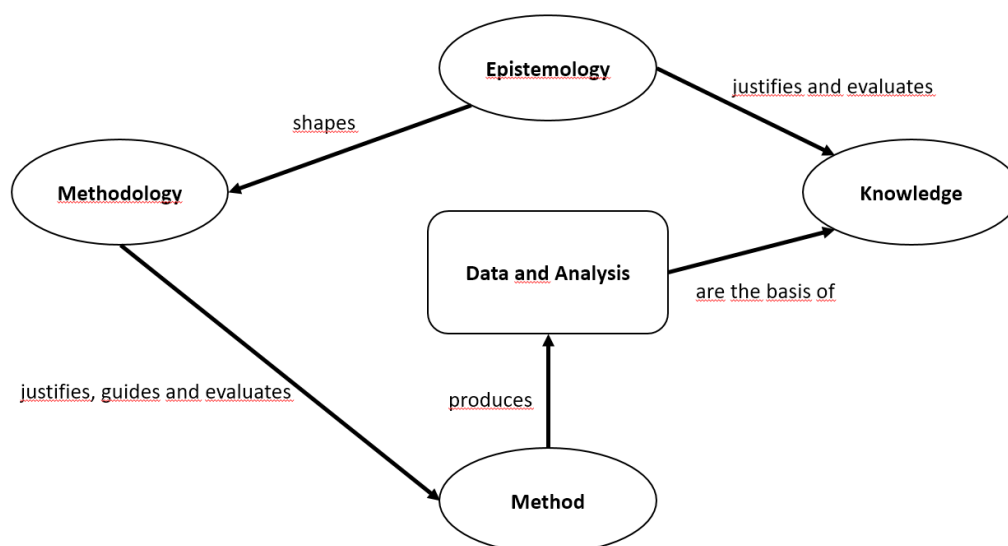
Source: Carter and Little (2007, p. 1317)

In this research, the objective data that suggests cause and effect links between strategies implemented by the UAE government to accomplish the goal of a knowledge economy based on a variety of theories and data, and their outcomes are appraised. Human perception of how the UAE can accomplish its goal of becoming a knowledge economy by means of the educational process are considered, is also required to answer the research question. Therefore, the assumptions of the objective stance, which assumes a universal source of knowledge, obtained by value free, independent, scientific like measurement or observation, and those of the subjective

stance of multiple sources of knowledge, which are socially constructed and value laden, both align with the needs of this study. This dual approach to answering the research question is referred to as the pluralist paradigm and reflects the importance of both single paradigms to optimise the outcomes of the study; its power is that it employs the strength of both, whilst minimising their weaknesses (Johnson & Onwuegbuzie 2004). The major weaknesses associated with the objective stance include the proposal that the researcher has no influence on the outcomes, that it is a mechanistic process. The phenomenological paradigm is most often criticised for perceived researcher bias, because the researcher attempts to interpret the meaning associated with a phenomenon as understood by others with different value sets form him/her, and for the lack of a systematic process (Creswell & Creswell 2018; Krauss 2005; Fisher & Stenner 2010). The differences in approach generate diverse outcomes and are merely a consequence of the underlying philosophies (Krauss 2005).

The exploratory approach allows the researcher the freedom to explore different possibilities, a flexible process, which commences with a broad idea that is narrowed as the research proceeds. Furthermore exploratory design intends to explain phenomenon that are new and/or poorly understood as the rapidly changing and unique UAE transforming to a knowledge economy. The skills and knowledge required to accomplish a knowledge economy and the economic and social advantages of doing so, are the subject of substantial existing theory. The quantitative research will fill in the understanding of the initial exploratory studies. According to Merriam (2009, p. 5) survey describes 'what is'; "how variables are distributed across a population or phenomenon". Frequency or findings of a representative selection is the aim of this method.

However, deep insight into the phenomenon is also needed to increase knowledge, and this design allows the researcher to change direction when new ideas emerge and require further investigation. Descriptive design will be applied even though it is of limited use as it is useful to this research because it allows the researcher to collect background information such as demographics, information about events, people and relationships, which are fundamental to sense making, regarding findings from the exploratory research (Ritchie & Lewis 2010, Creswell & Creswell 2018; Saunders, Lewis & Thornhill 2015).

As indicated, two theoretical approaches can be taken to research, the deductive approach or the inductive approach, the first implies that hypotheses will be devised and tested in the study by means of a suitable research strategy, and the second aims to collect data to build theory (Saunders, Lewis & Thornhill 2015). The differences in the two approaches are summarised in table 11.

Table 11: Deduction and Induction Compared

Emphasis of Deduction	Emphasis of Induction
Scientifically based principles	Identify and interpret the meanings individuals link to phenomena
Test known theory	Create new theory
Quantitative methodology can, numerical data is vital	Qualitative data gathering, textual, voice or media based
Research rigour depends on using controls to increase validity of data gathered	The methodology determines controls, for instance coding data to interpret it
Operationalises concepts so that they be measured quantitatively	Multiple interpretation of concepts
Highly structured so that research can be replicated	Highly flexible approach so that new information can be thoroughly explored; broad approach narrows as research proceeds
Value laden, researcher fully involved in study	
Large sample size vital to enabling generalisation of the findings	Sample size often small, expert opinions to gain deep insight

Source: Author adaptation of Saunders, Lewis and Thornhill (2015)

Therefore, this research adopts both approaches, enabling the findings to be compared with the concepts that comprised the Literature Review, because this process allows new findings to be more easily identified (Ritchie & Lewis 2010). Existing theories and knowledge required for a knowledge economy can also be tested, for instance the impact of education and other factors on it, such as the inclusion of business leaders in shaping educational policies.

The research philosophy selected for a research study is directed by the stance adopted, in this case the pluralist stance, so that positivism and interpretivism are both relevant (Fisher & Stenner 2010); pragmatism is the philosophy chosen for the

research. Pragmatism enables the subjective and objective stances to be applied in the same study, practical applied research, which integrates both perspectives, in order to describe the data as fully as possible and multiple views are adopted for answering the research question (Johnson & Onwuegbuzie 2004; Saunders, Lewis & Thornhill 2015). The unique set of values and beliefs, influenced by national cultural norms, profession and diverse life experiences is of vital importance to answering the research problem, and the participants in the research derive from different national backgrounds, cultures, formal and informal education processes and professional experiences, and are expected to have widely different perspectives on how the UAE knowledge economy can be best achieved (Ritchie & Lewis 2010; Bryman & Bell 2015).

The research questions could be answered by a range of research strategies including experiment, survey, case study, action research, grounded theory, ethnography and archival and documentary research. However, survey in the form of semi-structured interviews and a questionnaire provides the means to employ both a quantitative and a qualitative approach, as is necessary in this research (Jonker & Pennink 2010).

The survey strategy includes qualitative and quantitative questionnaires and semi-structured interviews. The quantitative questionnaire provides a standard set of questions, in which the participant has a limited choice of response to select from and can gather trends, attitudes and opinions of a sample of the population. The responses can be analysed using statistical methods, which allow the validity of the findings to be scientifically rated for their rigour and to be judged as being representative of the entire population or not (Creswell & Creswell 2018). In contrast the qualitative questionnaire can elicit substantial information, if the questions are phrased and sequenced expertly, and in some cases additional questions can be asked to gain further insight into the responses made (Ritchie & Lewis 2010). Semi-structured interviews tend to aggregate the advantages of the two other methods, since the researcher can ask questions and, when unexpected information emerges, further questioning is possible (Saunders, Lewis & Thornhill 2015; Creswell & Creswell 2018). Since this research aims to gather objective facts and subjective opinions, two surveys are employed, a quantitative questionnaire and semi-structured interviews.

3.3 Data Collection Plan

3.3.1 Methodology Overview

Three major types of methodology are employed in social science research, the single qualitative and quantitative methods, and mixed methodology. The purpose of quantitative methods is discovery, and they commence by the creation of hypotheses, which must be proven or not proven by the research, since this methodology aligns with the positive stance; experiment is one of the major tools used to measure the phenomenon and hence resolve the hypothesis as true or false. In contrast, qualitative methods are focused on new theoretical concepts, and initiated by searching for meaning to explain the phenomenon, which is gathered by means of conversations. Then analysis is conducted by establishing the significance of words, so that the outcome is to gain further insight into the issue (Bryman & Bell 2015; Ritchie & Lewis 2010). Mixed methods is a combination or integration of the two approaches. Initially mixed methods were developed to reduce the weaknesses in the single methodologies but one of its major disadvantages is the length of time required to complete a study (Creswell & Creswell 2018).

The mixed methods approach has been determined as appropriate to fully answer the research problem, in section 3.2 because a pluralist stance is taken to the research, and objective facts and subjective opinions will provide a more informative outcome to the study. In this case the exploratory sequential mixed methods approach is employed, the qualitative semi-structure interviews about the role of education in supporting the UAE's ambition to become a major knowledge economy followed by the quantitative questionnaire to identify the skill-set needed, trends and perspectives from business leaders and other business professionals.

3.3.2 Context, Data Collection Methods, Population and Sampling

The context of this research is to determine the opinion of UAE business leaders and business professionals regarding the role of education in supporting the UAE to meet its goal of becoming a knowledge economy by 2021. The UAE's transition to a knowledge-based economy is inseparable from changing and developing the role of education to generate the skillset required to accomplish it (Hargreaves et al. 2010). Whilst, various strategies and frameworks exist for doing so, an appropriate

educational model must reflect the local context. Since there is no accepted definition of a 21st century skill-set (Bellanca & Brandt 2010), the input from business leaders is of importance regarding the role of education and in describing the skill set for the UAE's knowledge economy; according to Holstein and Gubrium (2001, p.301). All sites and participants profiles are illustrated in table 12 and table 16 in the Result part.

The largest companies in the UAE are State owned banking, investment and financial services companies, energy, estate agency, transportation and telecommunications organisations, with market capitalisation ranging from $US43.62 billion to $US6.87 billion (Gulf Business, 2018). The number of business registered in 2015, according to Statista (2019), was approximately 346,000, with the highest concentration in trade and repair: 132,000, construction: 63,000, manufacturing: 30,000 and estate agencies: 26,0000; indicating that whilst some of the largest companies may be transforming to knowledge based strategies, the private sector is not characterised by knowledge enterprise.

Official UAE Government figures on economic activity, indicate that there were just 161 private limited companies in 2016 and 2891 branches of foreign subsidiaries (MOE 2017), which suggests that most organisations included in Statista (2019) are small and medium sized enterprises. Therefore, official Government figures are adopted for sampling purposes in the quantitative part of the study. According to Merriam (2009, p. 5) quantitative research, for example inquiry of survey describes 'what is'; "how variables are distributed across a population or phenomenon". Frequency or findings of a representative selection is one aim of this method.

The major challenge of mixed methods is to coordinate the two approaches in a resource effective manner and answer the research question fully (Creswell and Creswell 2018). Therefore, each aspect is carefully organised to ensure that it fully meets the needs of answering the research question.

The qualitative aspect of this research has the major purpose of contextualising the skills required, and role of education, for ensuring that Emiratis learn the required skills and attitudes to be capable of making a significant contribution to the knowledge economy, in leadership and other positions in private companies and in public sector institutions. Diverse opinions on the skills required and the type of educational policy and intervention have been expressed in previous studies, as

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illustrated in the Literature Review Chapters, so that establishing the perspectives of business and education leaders in the UAE is vital. In depth insight into the issue is required for the role of education and generalisability, that is the focus of quantitative methods, for the skill set needed.

A qualitative approach, described by Manen (1979), as an umbrella term that includes description, decoding, translating and other methods of determining meaning, and mirrors some of the activities needed to answer the research questions of this thesis. The rationale of qualitative research is to enable rich description of a phenomenon in a language that is readily comprehensible by all that are concerned with the issue (Sullivan-Bolyai, Bova & Harper 2005). In addition, participants are not restricted regarding how they answer a question, the type of content they chose to reveal, because the questions are worded in such a way that personal observations, impressions and reflection on what they have observed or heard are encouraged (DiCicco-Bloom & Crabtree 2006).

From the perspective of this thesis the insights obtained are likely to increase understanding of the diverse issues and, therefore support policy making, analysis and the development of contextualised solutions regarding skills sets required to accomplish a knowledge economy. This approach is also recommended as a means for the researcher to learn from the participants, which supports more accurate evaluation of the issue (Sullivan, Bova & Harper 2005).

The sample for this study is a non-probability purposive sample (Ritchie & Lewis 2010), which is justified on the basis that expert opinion is required to answer this research question (Creswell & Plano Clark 2011). The researcher identifies those individuals with the depth and breadth of knowledge on the challenges and opportunities of designing and successfully implementing an educational policy, related curriculum and teaching and learning methodologies to ensure progress to a knowledge economy, in the medium to long term. Purposive sampling is effective only when the chosen experts agree to share their experiences and opinions and are able to articulate them in a manner that contributes to a holistic view of the phenomenon (Bernard 2002).

The chosen participants are all able to provide insight on different aspects of the issue (Palinkas et al., 2015), for instance education leaders are influenced by government

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economic and social policies, current educational theories and institutional reports, such as those developed by OECD and UNESCO. In contrast, business leaders are most interested in how the labour market will provide sufficient employees with the required attributes to enhance profits through application of technologies, innovation and associated competitiveness. In the UAE, business leaders tend to be responsible for a range of areas and may operate in different sectors, such that they have broad knowledge and responsibilities rather than a narrow deep presence in a particular sector.

It is also likely that the role of education is evaluated in various ways (Dixon & Dogan 2004), contrary to the principles of positivism, which requires a single reality and a very structured approach (Saunders, Lewis & Thornhill 2015). The purposive sampling technique is frequently employed in medical research, and Cuban (2013) suggests that there are many similarities between medical and education studies because they intend to support society and have a few major purposes, changing mindsets, developing skills, learning to manage emotions and improving depth of knowledge; both are complex society based industry sectors that impact on long term well-being and economic growth.

The research intends to conduct interviews with a total of approximately 15 individuals, including business leaders, education leaders and professional head-hunter recruitment personnel. The recruitment professionals active in the UAE, particularly Dubai and Abu Dhabi are important participants because they are fully aware of the skill set required to realise the UAE knowledge economy; these two Emirates also have the largest populations and economic wealth. Abu Dhabi's hydrocarbon reserves account for more than 95 percent of total UAE reserves and its ambition is to become the education hub for the UAE (Executive Council 2007).

The criteria for selecting participants was a business leader would be represented by a CEO of an international multicultural company, with a minimum of ten years' experience of working in the UAE, and preferably twenty-five years' total work experience. These characteristics were selected on the basis of Jaques' (1986) Stratified Systems Theory, which was originally concerned with organisational design and suggested that individuals operating at higher levels of the organisation required higher level cognitive skills. Cognitive skills were defined by Jacques (1986, p.361)

as the "ability of individuals to engage in goal-directed behaviour in solving problems and performing everyday work," and specifically, intellectual ability.

The organisation was depicted as comprising seven strata with the highest aligning with senior executives, because the highest levels required the individual to make decisions in conditions of uncertainty, because sufficient information is not available, and to manage timescales for implementing them. In addition, the problems are complex, such that critical evaluation is vital, and leaders who possess the capacity to quickly generate a range of ideas, words and phrases that describe a context, referred to as ideational fluency, can better forecast the second and third order implications of the decision taken and align them against the probability of their success (Burns & Jacobs 2013). The key features of each strata are summarised in table 12.

Table 12: Summary of Jaques' Seven Strata

Stratum	Description of Cognitive Skills
1	Work is conducting activities with a time frame of less than three months, linear thinking and practical judgement used for problem solving. Shop floor worker or sales administrator role type
2	Hands on task with a three to twelve-month timescale, previous experience is employed to overcome challenges and/or prevent perceived problems. Exemplified by foreman or small business owner
3	Capable of considering alternative solutions when developing and implementing plans to accomplish short term goals, maximum two years. If the original decision is inappropriate, changes the solution. Department manager, owner of several small business units
4	The individual is responsible for, and capable of managing and resourcing, several different projects or units concurrently; maximum time frame is four years. Able to prioritise tasks within the more complex environment in order to accomplish goals. Plant Manager role for instance
5	Able to provide direction to whole systems in a constantly changing environment by identifying and managing connections between variables. Forecasts second and third order effects and implements interventions with a five to ten-year timescale for completion. Divisional Executive role
6	Responsibility for implementing policy decisions regarding operations of sub-ordinate systems. Building large contact networks to gain market intelligence and to build confidence and positive relationships globally. Contributes to corporate performance, profitable outcomes and business sustainability, time scale from ten to twenty years. CEO of company with less than 20,000 employees, Executive Vice President of larger global company.
7	Represents the organisation on a global basis, devises global strategies and acquires and develops stratum five units by a range of growth strategies, such as merger and acquisition and joint venture and for the purpose of meeting long term goals, with timeline of more than 20 years. Expansion is financed with global financial resources. Shorter term strategies are developed to ensure sufficient future resource capability. Roles include CEOs of the largest global companies, high level Civil Servants

Source: Author adaptation of (Jaques 1986; Burns & Jacobs 2013, p. 3)

Therefore, leaders at strata 7 are important to this research because they are likely to have the broadest and deepest knowledge of the knowledge economy and understand the complexity and uncertainty involved in delivering the desired outcomes, whilst leaders at other high cognitive levels have complementary perspective to contribute.

Four major cognitive processes were employed by Jaques (1986) to develop these descriptions: assertive, referring to specific situations; cumulative, relating to combining diverse types of information from a variety of sources; serial, associated with discussing concepts on a logical order; parallel, concerned with simultaneous discussion of two or more related issues. These processes are applied to information

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complexity in the order, physical objects, symbols, concepts and finally universal contexts and linked to each strata and decision-making complexity.

Although Jaques´ Stratified Systems Theory has been criticised by some theorists, it has been used by global bodies including the U.S. Military, the Church of England (Jagues & Stamp 1990) and in diverse business settings, for assessing employee abilities and for organisational development (Grobler 2005; Kleiner 2003; Burns & Jacobs 2013). Since this thesis focuses on transformational change in the UAE economy and the required education policies, pedagogies and culture change to enable it, the challenge for leaders is immense, as emphasised by Kotter (2006). The leader must comprehend the task levels involved and the complexity and interconnectedness of the related issues, as well as possessing long term strategic vision.

The quantitative element of this study allows the researcher to reach a wider range of participants, drawn from Jaques' strata, levels 4 to 7 and to identify descriptive variables such as educational policy and skills.

3.3.2.1 Validity test

The sample for the quantitative study was intended to be a probability sample of at least 350 individuals working in private limited companies and branches of companies in UAE. The sample size being representative of the population of 3052 companies, including 161 private companies, and guided by the Saunders, Lewis and Thornhill (2009, p. 219); a 95% confidence level and 5% margin of error.

The researcher is aware that a high response rate is required in order that the responses are representative of the population and therefore intends to remind those invited to take part of that completion date required. Since the survey is conducted online the sampling type is similar to random sampling because the researcher has no influence on the individuals who choose to respond to the questionnaire. The advantage of this approach is that the findings are generalisable to the whole population and the outcomes are likely to strengthen the findings of the qualitative research in terms of research validity.

The time horizon for this thesis is relatively long, it develops over several years, when the timeline for the UAE knowledge economy policies to emerge and develop is considered. Therefore, an initial series of interviews were conducted in 2016 and a

second set in 2018, In contrast the actual interview remarks represent a short period of time, a snapshot of the perceptions and emotions that are generated by the participants at the time of the interviews (Bryman & Bell 2015).

3.4. Instruments

Primary data is collected to answer the research questions and obtained by use of two survey instruments, namely two sets of qualitative semi-structured interview (sample Appendix 2) and a quantitative questionnaire survey (sample Appendix 3). The qualitative interviews were conducted prior to the distribution of the survey, and any important aspects that were noted in the responses that were not included in the original questionnaire document were integrated into an appropriate question in the survey. The first set of interviews in 2016 and the second set in 2018.

Three types of interviews were available for primary data collection, structured, semi-structured and unstructured; in this thesis semi-structured interviews are most appropriate, and that decision is now justified. In structured and semi-structured interviews, the same set of questions is the basis of the interview with every participant, so that there is consistency of approach and a more effective means of comparing and contrasting their perceptions and feelings. The pre-interview preparation of questions has several advantages, including enabling the researcher to control the interview, providing him/her with more confidence, and promoting a professional image, both of which are vital when speaking with executive level interviewees (Creswell & Creswell 2018; Saunders, Lewis & Thornhill 2015). The interview questions are derived from gaps in the knowledge that were identified in the Literature Review Chapters, which also served to refine the research questions. This sequence generates higher validity to the findings, since the study is most likely to accomplish what it intended (Ritchie & Lewis 2010).

A major issue with the structured interview is that it may appear similar to interrogation, because rapport cannot be built effectively by asking further questions for clarification, therefore, the context may alienate the respondent. Semi-structured interviews, by contrast, have the same set of questions but the interviewer uses them as a framework and has the freedom to ask further questions, when an unexpected response is given, and more depth is useful for the thesis. This capacity for flexibility in the interview, creates an environment of a two way conversation, in which the

interviewee feels more relaxed and likely to provide broader and deeper opinions (Gill et al. 2008; Saunders, Lewis & Thornhill 2015); it is particularly effective in complex contexts when sense-making is a vital criteria, as is the case in this research (DiCicco-Bloom & Crabtree 2006). The technique also ensures that every interview is unique, discussing the main themes and evoking further depth on matters relating to them (Gillham 2000).

A total of 15 interviews with Senior Managers were held. Due to their diverse experiences across various industries they form a representative group. Furthermore with 15 interviews saturation was reached as no substantial incremental insights were identified in the latter interviews which is in line with previous studies (Guest, Bunce, & Johnson 2006). The interview questions are attached in Appendix 1.

A pilot study was conducted prior to the main interviews taking place, so that the researcher could make changes to improve the survey instruments, for instance changing the order or number of questions, identifying ambiguous or leading question, or specific specialist terms that might not be well understood by the population. In addition, it was important to check that the stated timescale for the interview of 45 minutes was realistic; the researcher is aware of the busy schedules of business leaders and professionals and must respect this (Ritchie & Lewis 2010; Creswell & Creswell 2018).

The pilot for the first set of interview questions was peer-reviewed, approved of the DoS at that time who sadly passed away and an interview held with the Chief Executive Officer of a global multinational company, and the second set of interviews was piloted in two ways, firstly by referring to the questionnaire employed in the first set of interview and the response rate to it, which was low as many questions were not being answered due to lack of time of business leaders and the majority could therefore not be used in this study. The conclusion of the researcher and the newly appointed Director of Studies for this research, who assessed that some of the questions lacked depth and needed be shaped in a manner that would gather the major perspectives and needed further alignment with the literature review. This original questionnaire was also appraised by an experienced expert in education consultancy and large company global management training, who commented that the design contained too many closed questions and might be too long.

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When the researcher wrote the second set of interviews questions, they were designed along major themes in the Literature Review and approved by the DoS and peer-reviewed, and then piloted by the same expert in education consultancy and large company global management training, as well as two local contacts. A question was asked to be removed, owing to its sensitive nature in UAE terms (Ritchie & Lewis 2010) and the researcher took the opportunity to add additional comments, if time allowed and she felt that more direct information was required relating directly to the major theme of the thesis. All versions of the semi-structured interview questions are available in Appendix 1. The interviews took place with the purpose of gathering the perspective of each participant on matters of major importance relating to the UAE's knowledge economy. The researcher also provides the interviewees with a copy of the questions prior to the scheduled interview time, so that they have time to consider their responses, especially as they are likely to have very busy work patterns (Holstein & Gubrium 2001). A letter of consent was also provided, and the researcher verbally informed the participant that participation is voluntary and confidential which will be further discussed at a later stage in this chapter.

The questionnaire for the thesis was designed carefully, since research methods experts suggest that writing a good questionnaire is a difficult task (Saunders, Lewis & Thornhill 2015): the advice given by several experts was studied and applied to questionnaire preparation. The questionnaire began with a note for the respondents, explaining its purpose and the part they could play in the research, and asked for their agreement to continue to answer the questions (Saunders, Lewis & Thornhill 2015).

The questions were sequenced in logical order, with the initial eight short category questions used to gain attention, and to quickly gather facts about each individual, so that a profile of the respondents could be developed at the time of data analysis. The remaining six questions were mainly ranking and rating questions: the ranking questions intended to discover, which elements were most important in knowledge economy, for instance requisite skills, because previous research had demonstrated that rankings varied over time; the rating questions had a Likert type design with five alternatives, from strongly agree to strongly disagree, the answers to which provide an assessment of the strength of opinion about a statement (Saunders, Lewis & Thornhill 2015; Creswell & Creswell 2018). For questions with Likert scale, in order to measure

the internal consistency of a set of scale Cronbach's alpha is used. Some questions merely required a yes or no answer, so that one of the survey items adopted this approach (Collis & Hussey 2014).

The design of these six questions was vital because the length of time taken to complete the questionnaire was relatively low, since the participant read the statement and just ticked a box. The researcher tested the time taken to complete the questionnaire personally, and this was repeated in the pilot study and then doubled it, as a guide for the participants; the approximate time for completion was stated in the instructions. The ease of completion was a tactic to encourage as many participants as possible to complete the whole survey (Saunders, Lewis & Thornhill 2015; Creswell & Creswell 2018).

This instrument was pilot studied by a university professor, a peer and an education and commercial teaching and training expert, who offered several suggestions as to changes in wording, removing sensitive items and expanding the range of participants. The researcher reshaped the questionnaire but ignored one remark, since it related to a suggestion made by one of the most senior Emirati business leaders, who took part in the second set of semi-structured interviews; the pre and post pilot versions of the questionnaire are available in Appendix 1. The questionnaire was distributed by means of an online survey service Survey Monkey (SM 2019), which was selected because of its reputation and the length of time it had been operating, but also because it offered data gathering and analysis, including data output that was suitable for SPSS analysis that had been chosen to analyse this part of the primary research. In addition, the online survey was found to be more successful, with higher response rates than traditional survey distribution by Baruch and Holtom (2008). The participants were invited to complete the survey within a month's period and reminded about the final date after a week's time, in order to gather as many completed responses as possible. Still many participants answered the first section with the background information questions and didn't continue. To evaluate the questionnaire, the sample size for the relevant population is being determined utilizing two measures, namely margin of errors and confidence levels. The population for this research consists of Senior to Middle Management in the UAE. Assuming that the active workforce in the UAE consists of 2.5 million active workers (Schiliro 2013), out of which around 10.0% are

professionals (Eposito, El-Sholkamy & Fischbach 2017) the relevant population equals 250'000. Assuming a margin of error of 5% and a confidence level of 90% the required sample equals 271. The researcher considers the actual sample size of 138 participants representative for a number of reasons. Firstly, the demographics of the respondents show a relevant proportion of Emirati and Expatriates. Furthermore, the respondents work in various industries and there is a focus on senior and middle management participation. Therefore, the researcher considered the 138 participants who completed the questionnaire appropriate because of the acknowledged difficulty of persuading Emiratis and expatriates in business environments to complete and return questionnaire surveys. This further strengthen the lack of research culture in the business sector.

3.5 Data Analysis Plan

The primary data gathered from the qualitative semi-structured interviews is analysed using a combination of thematic and content analysis, as described by Mayring (2014), this methodology was developed in an attempt to demonstrate to traditional positivist researchers that qualitative analysis was rigorous. The first stage in the process is to identify the main categories or themes for the coding exercise and then the related sub themes and associated codes, in other words the most significant issues and their elements they comprise. Qualitative analysis has two complementary strategies according to Rust (1981), to mandate that a structure for the analysis that is visible and to break down the total communication, but then to identify the relationships between individual aspects to recombine their meaning, in conscious manner.

A basic technique in qualitative analysis is to establish the frequency of specific words or phrases and to compare them with the frequency of other words, which provides some indication of their relative importance to the research, or to certain individuals or groups of participants (Mayring 2014). This is an important concept for this thesis, as the researcher expects to find diversity in the perceptions of participants from different sectors, regarding the same phenomenon, although Mayring (2014) emphasises the difficulty regarding being able to distinguish between grammatical forms of words and expressions of quantity.

This researcher does not consider identifying frequency as an issue in this research, because analysis will be conducted manually, and the frequency with which an element is mentioned is only one aspect of the analysis. The major focus of the analysis is on conforming to a systematic procedure, which is shaped to meet the needs of answering the research questions, in other words of gaining insight into the major themes of the thesis. The order of the elements and sub elements is defined by the researcher before the analysis commences, and each element and sub element is given a colour code and an acronym, so that the interview transcript can be scrutinised, and the relevant words and phrases highlighted using an electronic highlighter.

The whole interview transcript for each participant is analysed by each category and its subcategories separately, when this category is complete, the researcher focuses on analysing the text to find words and phrases relevant to the next one. Since the categories, sub categories and their respective acronyms and colour codes are listed in the appendices, Appendix 2, and the coded transcripts are also added as annexes, any other researcher can check how the analysis has been conducted (Mayring 2014); consistency and credibility of findings, or qualitative reliability is enhanced as a consequence, aligning with the meaning of reliability from a quantitative methods perspective (Ritchie & Lewis 2010). Hence the category system is fundamental to creating research rigour (Mayring 2014). This transparency ensures the validity of the research during the result analysis.

The interview findings are presented by theme, the transparency of the findings is enhanced by thick description, including direct quotations, which enable the reader to understand how the analysis procedure was conducted, and how the words and phrases were interpreted by the researcher (Ritchie & Lewis 2010).

The survey questionnaires are initially scanned for completeness as only completed questionnaires are included in the thesis; the response rate is calculated by dividing the number of surveys distributed to the number of completed responses, expressed as a percentage (SM 2019). The data collected is analysed by question and a data output from Survey Monkey allows statistical analysis to be conducted using SPSS software.

The first step is to conduct preliminary analysis, for instance descriptive statistics that provide a profile of the participants, the types of distribution, for instance the

normality of the distribution, and checking for outliers, values that are significantly higher or lower than average (Pallant 2010).

The relationships between variables x and y, and the degree of difference between groups was used for males and females. Chi-Squared test, measures not just the significance of the finding but the degree of association between variables which was used on the population. The output from the SPSS analysis provides a descriptive statistic (Pallant 2010; Saunders, Lewis & Thornhill 2015), which is important to understand and answering the research problem of this thesis.

The discussion of the qualitative findings will comprise comparing them with the main theories and concepts that formed the Literature Review and highlighting new or unexpected findings that this study has uncovered. Discussion of the quantitative findings also involves comparing them with the Literature Review concepts in order to prove or disprove the hypotheses. The objectives, research questions and how they are linked to the data collection and instruments and all the sites of the interviews are illustrated in the conclusion respectively analysis section and in table 13.

3.6 Scope of the Thesis

The scope of this study is limited to obtaining the opinions of business leaders and business professionals currently working in the UAE, regarding the role of education as a means of accomplishing transformation from a Rentier State dependent on revenues generated from selling its natural resources to other nations. The focus is limited to determining the major skills, knowledge and attitudes, which future employees require to support companies operating in the UAE to adopt the strategies and techniques that reflect a knowledge organisation. In this perspective, the study attempts to identify the education policies and pedagogies that business leaders consider will equip young people with these skills from the time they enter formal education until they finish it at the end of the secondary phase, as well as the tertiary education options that could be offered to enhance those skills for the workplace, and for innovative activities shared between tertiary education and private firms. An additional aspect of the study is to establish how business leaders consider that they could collaborate with the government and education sector to accelerate the rate of progress towards the knowledge economy in 2021, by providing input into the education curriculum to shape it more appropriately for labour market needs, and

interventions that would provide young people with live experience of workplace behaviours and goals. Whilst the main UAE Government strategy relating to the accomplishment of the knowledge economy is to ensure that Emiratis gain the skills, attitudes and knowledge required to take a substantial role in delivering it, this thesis extends beyond that prime target to all young people because there are insufficient Emiratis in the UAE to satisfy the needs of the labour market.

This research does not concern how business leaders can influence the current UAE labour market other than to evaluate the strengths and weaknesses of it; anything more is outside the scope of the study. An additional limitation of the research is to avoid including any sensitive issues that might be offensive to the local administration (Ritchie & Lewis 2010). The lack of an agreed definition of the knowledge economy and of limited metrics to objectively assess progress towards it are also acknowledged, since individual nations are pursuing diverse strategies, emphasising different industrial sectors and have distinct cultures skills sets and physical resources.

3.7 Ethical Considerations

The ethical principles of social science are adhered to in this research, particularly as Kvale and Brinkman (2008) emphasise the potential for many ethical issues when subjects of broad socio-political interest are published, and more so when individuals from the highest levels of public and private sectors have been interviewed as an integral part of a study (Holstein 2001); the perspectives of these individuals have substantial impact on society. Furthermore, due to the small country and few business leaders the confidentiality of the participants and their perspective in the research needs to be protected. The researcher realised at an early stage that the participants did not agree to recordings and therefore transcripts were written down after an interview in order for the researcher to analyse the interviews. The researcher completed the university's ethics form confirming the details of the thesis and how it met the required standard.

Consequently, prior to conducting the study, the researcher obtained permission to interview key staff from the participating organisations and explained the purpose of the research; a letter of consent given to the participants before the research takes place, Appendix 3. Furthermore, the participants were verbally informed again before the interviews. The confidentiality of the respondents was guaranteed, their actual

positions and names of firms in which they are employed and the nature of the information they provided. Prior to the interviews, each participant is provided with a written statement regarding the confidential nature of his/her contribution, that s/he could withdraw at any time, and that all transcripts would be held securely, coded and destroyed once the research is completed (Saunders, Lewis & Thornhill 2015).

One of the risks aspects of this study is asking about sensitive local issues, which the researcher has avoided as much as possible by taking advice from local educationalists and trusted UAE National contacts regarding what to include and what to avoid in the Literature Review and in the questionnaires and interview questions. The researcher is aware of own bias, especially in the case of interpreting qualitative research and intends to demonstrate transparency by the use of thick description and triangulation of data (Ritchie & Lewis 2010). Furthermore, the researcher is an education professional with international practical experience in teaching and researching in diverse settings and international business environments and will use this experience to reduce and avoid own bias. The empirical research of this study is exploratory from a Business Leader perspective. Specific limitations regarding the various methods have been stated in the sections above and is further discussed in the limitation part of the conclusion chapter. Additional limitations with an exploratory study are that the findings might seem enough convincing to make premature conclusions. the researcher is aware of the fact that the results from the interviews cannot be generalized. However, the insights gained might be leveraged and related to in similar situations and facilitate the perception of a similar situation in a different context.

The quantitative data also reduce any potential bias and the triangulation of findings with the qualitative research will strengthen the validity of the findings (Saunders, Lewis & Thornhill 2015). Still the researcher is aware of the fact that a quantitative survey might not provide the specific alternative for the participant and therefore an open-ended question was added at the end. Additionally, the thesis is peer reviewed to increase its quality and trustworthiness (Bass 1990).

3.8 Trustworthiness, Authenticity of data and Reliability and Validity

The terms reliability and validity were originally derived for positivist studies using the objective stance. The reliability of a quantitative study is measured according to

how easily the findings could be replicated by using the same methods, each qualitative study tends to be different because it adopts an inductive theory building approach (Ritchie & Lewis, 2010). In qualitative research, the meanings of trustworthiness and authenticity of data were shaped to align with the type of research, and Lincoln and Guba (1985) suggest that the reliability of a study cannot be separated from its validity, if validity is high, then reliability is automatically high. However, Carlson et al. (2009) propose that reliability is measured according to the consistency of the findings, and that the full details of the study should be made available to provide the evidence for this, and for conducting a similar study (Saunders, Lewis & Thornhill 2009). The use of the Mayring (2014) process to interpret the findings, provides demonstrable evidence that rigour has been used, and that the researcher's bias is minimised by taking a systematic approach to the analysis of the data, which enhances its trustworthiness. A qualitative study is considered trustworthy if the researcher is able to demonstrate the use of practices, which allow the study to be audited by others (Sandelowski 1993). In the thesis, the researcher had provided all the detail of methodology, obtained a peer review of the study and used thick description (Ritchie & Lewis 2010) including direct quotations to enhance trustworthiness. In addition, the reliability of the qualitative aspect is enhanced because the researcher gives the participants the opportunity to read the interview transcript and to make any amendments they wished (Kvale 1996).

The internal validity of a study is a measure of how close the intended and actual outcomes are, in this research, the questionnaire and interview questions were derived from the Literature Review, the content of which was directed by the research questions, and therefore internal validity is high (Kramer, Bernstein & Phares 2013). External validity is a measured by the generalisability of the findings to the whole population in quantitative research, which is inferred by use of a probability sample, as employed in this study. In qualitative research validity is associated with the credibility of the findings (Lincoln & Guba 1985). The credibility could be determined in many ways according to Shenton (2004), who proposed ten procedures including selecting suitable research methodology and providing substantial detail of the techniques, linking questions to the study context, allowing participants to express their views by means of the type of questions posed to them and carefully checking

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interpretation of the findings against the original transcripts; these four techniques are emphasised in this study. In qualitative research, the degree of triangulation of data from different sources is a measure of high validity (Ritchie & Lewis 2010) and transferability to another context is often compared to the quantitative methods concept of generalisability (Shenton 2004) as trustworthiness and authenticity. This research is expected to show considerable triangulation and, owing to the nature of the subject matter, and transferability. The convergence of the findings from the quantitative and qualitative elements represents further evidence of high validity, which Johnson and Onwuegbuzie (2006) refer to as legitimisation.

CHAPTER FOUR: RESULTS, ANALYSIS AND DISCUSSION

4.1 Overview of Chapter

This Chapter comprises the research findings from two major survey instruments, the first derived from two sets of semi-structured interviews, which give a longitudinal character to the research and second a quantitative survey which is based on the insights gained in the interviews.

In the first part of the Chapter the interviews enable the researcher to compare the differences between the responses to questions initially posed to the business personnel in 2016, and those presented to other individuals in December 2018. The semi-structed interviews are analysed by themes and then coding is employed to identify the perspectives of the participants by theme. In the qualitative analysis, the two sets of interviews, are likely to enable the researcher to gain some insight into how, if at all, progress towards the knowledge economy has developed in the UAE over the period of five years, and/or the position of the business leader in regards to helping to shape its direction.

In the second part of the Chapter the questionnaire survey results are critically analysed, discussed and interpreted first using the appropriate statistical methodology. The research questions are related with both instruments as shown in table 13.

Table 13: Relation of research Sub Questions with instruments

Research Sub Questions	Related Interview Codes	Related Questionnaire Hypothesis
SQ1: Which skills, knowledge and behaviours are required in UAE's transition to, and continuing development of, a knowledge-based economy?	KE - Knowledge Economy	H1: The most critical skills for creating and sustaining a knowledge economy are similar to previous studies
SQ2: What is the precise nature of the gap between the skills, knowledge and behaviours of both the Emirati and Expat work force and that required in the UAE knowledge economy?	KE - Knowledge Economy EC - Emirati Context	H2: The required critical skills in the UAE's transition to a knowledge economy are NOT available
SQ3: What challenges & opportunities exist to enabling education to contribute effectively to UAE's transition to a knowledge economy?	EP - UAE Education Provision	H3: The UAE schools and universities DO NOT generate graduates with the requisite skill set to meet current and future labour market demand
	RE - Role of Education	H4 The critical success factors for school and higher educational establishments to support the knowledge economy are NOT in place
SQ4: What is the involvement of Business Leaders in influencing UAE Government and universities to ensure that curriculum design and outcomes meet future labour market needs	SP - Strategic Partnerships	H5: Business leaders in the UAE have NOT formed diverse types of strategic partnerships with UAE Government and universities to ensure that curriculum design and outcomes meet future labour market needs
	RE - Role of Education	

4.2 Analysis of Qualitative Data

The first part of the analysis was to define the themes and sub themes for coding the original transcripts and those of interviews conducted in 2018, in other words analysing the content. The two sets of interviews were coded separately, and the findings are reported individually, in each case according to the coding categories, so that there is a logical sequence, which related to answering the research questions.

4.2.1 Coding Preparation

The main categories for the coding exercise are:

- Knowledge Economy, UAE Educational Provision Strategic Partnerships, the Emirati Context and the Role of the Economy and the sub research questions which are relevant to this analysis are:

- SQ1: Which skills, knowledge and behaviours are required in UAE's transition to, and continuing development of, a knowledge-based economy?

- SQ2: What is the precise nature of the gap between the skills, knowledge and behaviours of the Emirati and Expat work force and that required in the UAE knowledge economy?

- SQ3: What opportunities and challenges exist to enabling education to contribute effectively to UAE's transition to a knowledge economy?

- SQ4: What is the involvement of Business Leaders in influencing UAE Government as well as universities to ensure that curriculum design and outcomes meet future labour market needs?

Definitions

These definitions for analysis are based on the Literature Review and the research questions and its connection can be found in the conclusion part.

Coding: Each main definition is colour coded and given an acronym, and sub themes are given the same colour code and extended acronyms such as KE1, KE2.

Knowledge Economy (KE <mark>Colour Code</mark>)

Knowledge economy is characterised by education and training to generate skilled professionals, a dynamic digital infrastructure, economic incentives and a network of universities, research establishments, private companies and communities,

and encourage entrepreneurship; a network of research centres, including universities, private companies and community groups to gather global knowledge, assimilate it and adapt it to the local context and therefore to use it to create new knowledge.

UAE Education Provision (EP Colour Code)

The main objectives of UAE education policy are to ensure that Emiratis and Expat students are provided with the skills and knowledge to make a major contribution to the country's goal of becoming a knowledge economy. This is demonstrated by its capacity to generate individuals with the required skills demanded by the labour market, the UAE ranking in PISA tests, higher education outcomes including research, partnerships between innovation/research centres, universities and private companies.

Strategic Partnerships (SP Colour Code)

Strategic partnerships in the perspective of the UAE Government focused on: tertiary level education policy, and the perceived need for universities to collaborate with private sector business in developing enterprise partnerships and maximising innovation possibilities; attracting international universities, encouraging companies to approach universities and research centres to provide technologies; attract knowledge industries and innovation centres.

Emirati Context (EC Colour Code)

Emiratis are UAE citizens, a minority population in a nation in which, expatriates represent the majority of the labour market; 7% of employed Emiratis work in private sector, public sector employment is preferred. Government education and labour market policy objectives is to enable UAE nationals to participate effectively in a sustainable socio-economic environment. The rationale is that UAE values will be protected by balanced development, and creation of diverse, flexible economy led by skilled native Emiratis and based on knowledge.

Role of Education (RE Colour Code)

The Education system in a knowledge economy plays a key role in generating a skilled labour force with the relevant skill sets, behaviour and knowledge which are crucial for increasing productivity and achieving economic growth

SUB THEME CODES

KNOWLEDGE ECONOMY

Major Skills Required (KE1)

The most vital skills and attributes that are required for a knowledge worker contributing to the knowledge economy

Current Labour Market (KE2)

The types of public and private sector jobs in UAE, the current skills of workforce and the required skills for accomplishment knowledge economy

Company Learning and Development (KE3)

The learning and development interventions applied by business leaders of private companies in UAE as being critical to business success

UAE EDUCATION PROVISION

Education Policy (EP1)

The current UAE Education Policy and how it is perceived by business leaders and other associated parties

School Education (EP2)

Formal pre-school, primary and secondary education, curriculum and pedagogy approved by UAE Ministry of Education

Success Factors School Education (EP2a)

The essential factors to generate the desired skills, behaviour and knowledge in young Emirati and Expatriates at school level

Current Accomplishment School Education (EP2b)

Description of the perceived progress made by the formal education system to prepare students for the labour market needs of the knowledge economy

Tertiary Education (EP3)

The post formal school education process comprising universities, research/innovation centres, vocational education and training

Success Factors Tertiary Education (EP3a)

The essential factors to generate the desired skills, behaviours and knowledge in young Emirati and Expatriates, who will also be required to fulfil labour market demands

Current Accomplishment Tertiary Education (EP3b)

Description of the perceived progress made by UAE tertiary education providers in generating higher educated emirates and expatriates to meet current and future labour market needs

STRATEGIC PARTNERSHIPS

Partnerships and Collaboration with UAE Government and Educationalists (SP1)

The current partnerships between UAE Government bodies, educationalist and business leaders to accomplish the skills, behaviour and knowledge required in a Knowledge Economy

Opportunities (SP2)

The perceived contributions that partners could make to enhancing the personal and professional attributes of higher education students toward knowledge economy objectives

Challenges (SP3)

The major barriers to strategic partners optimising the outcomes from their relationships regarding the knowledge economy and their individual objectives

School Education Policy (SP4a)

The influence that business leaders have in helping the UAE Government and educationalists to devise a suitable balanced school curriculum to prepare young people for the labour market

University Education Policy (SP4b)

The influence that business leaders have in helping the UAE Government and educationalists to devise the most required university degree courses to prepare students for a knowledge economy labour market

Vocational Education Policy (SP4c)

The influence that business leaders have in helping the UAE Government and educationalists to devise vocational education programmes to prepare young people for the future labour market

Business Contribution (SP5a)

Description of the additional contributions that business leaders make or suggest to developing the appropriate skills and knowledge required for the knowledge worker

Practical Interventions (SP5b)

The specific learning and development practices, that business leaders apply or recommend for these additional contributions to be effective

EMIRATI CONTEXT

Skills and knowledge of Industry 4.0 technologies (C1)

The skills and knowledge associated with industry 4.0 technologies, for instance cloud computing, robotics, smart manufacturing, the Internet of Things, Artificial Intelligence and Big Data

Emiratis (C1a)

The UAE citizen and generally characterised by the local culture

Non-Emiratis(C1b)

All expatriates living and working in the UAE

Reasons for difference (C1c)

The perceived reasons for differences in the skills and knowledge sets of Emirati and non-Emirati individuals in the education system and/or the workplace

Employment Criteria (C2)

The fundamental employee skills, knowledge, attitudes and experiences that the business leader prefers

Motivation for employing Emiratis (C2a)

The major motivating factors Emirati that would influence a business leader to employ Emiratis

Motivation for employing non-Emiratis (C2b)

The major motivating factors that influence a business leader to expatriate workers

Reasons for not employing Emiratis (C2c)

The major barriers to employing Emiratis with underlying rationale

Reasons for not employing non-Emiratis (C2d)

The major barriers to employing expatriates with fundamental reasons

ROLE OF EDUCATION

Imported Education Models (RE1)

Suitability of imported education models to the UAE cultural and economic context

Business and Educational Leaders (RE1)

Differences in views on the role of education and skillset needed between business and educational leaders in the country

Role of Education (RE3)

Role of education in UAE's transition to a knowledge economy and in the knowledge economy itself from a Business leader's perspective

4.2.2 Original Interviews

4.2.2.1. Participant Profile

The initial pilot study for the thesis was conducted with the Chief Executive Officer (CEO) of a global multinational company, with 28 years' work experience. This pilot was reviewed of a module professor and the researcher's director of study (DOS) at the time, who passed away. After this had been completed and question set refined, seven further semi-structured interviews were conducted in 2016. The details of all participants are summarised in table 14.

Table 14: Participant Profile Initial Interviews

Job Title	Profile
CEO	Employed by global multinational company operating on all continents Degree in Business Administration and PhD 28 years' work experience
CFO	Employed by a large regional bank Chartered Accountant, qualified in UK and Chief Financial Officer (CFO) for large company Over 35 years' work experience in the UAE, over 25 years as CFO
Managing Director Education Consultancy	Educational consultancy for Sovereign Wealth Funds, financial services sector. Over 25 years of working experience
HR Specialist	Master not further specified other than qualifications are not those needed in current job role. Airline industry
HR Manager	HR qualified
Head of HR Investment fund UAE government	Master in psychology. Business background with some education focus. Over 25 years of working experience
Business Psychologist	Recruits senior managers for the Airline industry. More than 25 years of experience
Business leader and current vice president of school	Bachelor degree. Over 25 years of work experience in education and various business areas

The job roles, varied specialisms and substantial experience represented by this group of interviewees, suggests that the responses given to the questions asked should

provide a diverse range of viewpoints, are well as deep and broad information relevant to this research problem.

4.2.2.2 Knowledge Economy

Major Skills required in a Knowledge Economy

The skills required for the knowledge economy were identified by the Business Leaders as diverse, required across all departments and parts of the company. Skills were identified in the areas of Personal Skills, Technical Skills and Basic Skills whereas most of the skills mentioned related to personal skills as highlighted in table 15 below. As inference for this thesis the critical nature of learning personal skills such as interpersonal skills, resilience & self-motivation as well as behaviour and work ethic were identified.

Table 15: Skills required in a Knowledge Economy

Personal skills	34
Interpersonal skills & teamwork	6
Resilience & self-motivation	5
Emotional Intelligence	4
Managing ambiguity	3
Communication	3
Work ethic	3
Organizational politics	2
Attitude & behaviour	2
Adaptability & lifelong learning	2
Critical thinking	1
Responsibility	1
Leadership	1
Cultural awareness	1
Technological skills	**3**
ICT	2
Innovation	1
Basic skills	**2**
Writing	1
Language & comprehension	1

A comment from one business leader was the need to "stay ahead, our company has always been pioneers in our field, the first company in the country to introduce new technology and structures." The business leader stressed the requirement for entrepreneurship and fundamental skills, such as mathematics; core subject knowledge was also emphasised by the educational consultancy and the business and education leader, these align with previous research by Hameed et al. (2016), Baker (2013) and Schoning and Whitcomb (2017) respectively.

The capacity to develop awareness of organisational politics was mentioned by two participants, one of the HR professionals and business psychologist who specified "organisational savvy, navigating politics, what motivates people". The importance of understanding politics in the sense of policy making and understanding motivations was stressed by Haddad (1999) and somewhat aligns with these remarks, although in a different context.

The psychologist also highlighted managing stress, associated with the requirement to concentrate on several tasks simultaneously were the major corporate lifestyle skills. The similar need to manage personal lifestyle and work commitments was mentioned by the CEO. Managers required emotional intelligence skills, resilience and the capability to manage emotions when sensitive or emotion laden decisions needed to be made. However, an additional stress related factor mentioned by several participants was the need for UAE graduates to take on management roles immediately they left university, in contrast to young professionals in western countries, who would have gained employment experience though part time jobs or education based work experience over a period of time. These comments were particularly focused on Emirati graduates, who needs to take on a huge responsibility and the related stress at an early age.

The capacity for personal development and academic development was emphasised by the business and education leader, who perceived that the education system was not currently supporting learning of those skills. In other words, self-induced lifelong learning was not being emphasised as important, despite being mandatory for accomplishing a knowledge economy. This finding reinforces OECD (2008) that school systems were very poor at developing students with lifelong learning skills.

In specific relation to management skills, the business psychologist emphasised critical thinking, capacity to evaluate diverse sources of information and to subsequently draw conclusions. These ideas align with the skills emphasised for 2020 in relation to transformation and maintenance of a knowledge economy by Schoning and Witcomb (2017).

Work ethic and work culture, open communication and good interpersonal relationships that enabled work outcomes to be accomplished, plus the capacity to adapt to and exploit the digital revolution, were mentioned by Business Leaders. Several other participants stressed work ethic, including the Head of HR with a degree in psychology, who proposed that this was a skill that could not be learnt at 30 years old but needed to be acquired at "a very young age". This implied that it should be acquired as a life skill during child development. Another comment regarding work ethic in the current labour market made by an HR specialist was that: "some want to

leave at 6pm and go home even if the job is not done and some think that one shouldn't leave before the job is done even if this means working until a late hour."

The inference is that the early childhood education of Emiratis and expatriates as well as culture is likely to have instilled these different fundamental skills, values and behaviours (UNESCO 2007) and different lifestyle skills (Pincus & Freeman 2004) so that the types of stress being managed by very young Emiratis is likely to be very different from that experienced by expatriates, who become their managers in the longer term. These remarks further emphasise the Business Psychologist's emphasis on the critical nature of learning personal skills to cope with a very different environment that may have been the cultural norm, as would apply to Emiratis.

Other skills cited were the ability to compromise and to be punctual. Two HR personnel mentioned behaviour as a general requirement and stressed that work related skills and knowledge the company required could be taught, the second suggesting that experience rather than education was the focus of recruitment practice in the company. The importance of soft skills development is evident from these responses, and from an early age. Although emphasising soft skills set in the primary school years may be too late, since educational development studies have indicated that behaviours are learnt much earlier as the brain rapidly develops and are retained by the individuals (FTF 2019; Samuelson & Kaga 2007). The inference for this thesis is that early childhood education in behaviour and work ethic is a critical gap that has not been emphasised by UAE government and educational consultants but have become evident to business leaders.

Current Labour Market

The focus of participants' perspective of skill requirements and their availability in the labour market was somewhat divided, with HR personnel concentrating more on the traditional fundamental work practices than on the skills required for knowledge work. The two HR participants show a western based cultural approach to skills sets and behaviours. In contrast the business leaders and the business psychologist had a more comprehensive view of personal and work-based attributes including technical skills than the other participants. Therefore an important inference from this thesis may be that conflict of focus is an issue in the UAE workplace with HR personnel

failing to identify or to give attention to soft skill development needs of new graduates, because their cultural norms integrate expectation of skills possessed by expatriates, whereas business leaders may have a broader perspective, possibly based on soft skills management training. Also, the work experience is less of the two HR staff and this is in line as well with Jaques (1986) criteria of being able to do parallel thinking and discussed in the methodology part of this research.

The characteristics of the current UAE labour market were indicated by the responses that described the workplace and the recruitment of staff. The HR professionals' comments stressed their main concern was managing conflict between expatriate groups, one mentioning 140 nationalities working in the company, another 100 nationalities. From the HR perspective, one HR participant working in the current labour market meant employing "strategies for working with multicultural staff has been to keep an open mind and to learn about other cultures and try to adapt and respect other perspectives and ways to handle things."

The CFO's remarks were somewhat similar, in that company 50 nationalities were employed and differences in their attitudes were mentioned, for instance poor work ethic, specifically that some cultures regarded having a job as a hobby rather than being seriously committed to it, and that sense of time varied across nationalities. However, the poor work ethic of graduates of various nationalities was emphasised by the CFO.

Furthermore, from the HR participants, there were comments regarding the mentors from expatriate countries who should support the Emiratisation and Emiratis, that some of the mentors are not taking their job very seriously either. They work for two years and then return to their home country without contributing the extra mile. These remarks demonstrate that cultural issues in the workplace are not confined to Emiratis and that some individuals in all the cultural groups working in UAE had rejected the ideas of altering cultural differences (Hofstede, Hofstede & Minkov 2010). The conflicts mentioned also demonstrate that organisations reflect social relations, so that in these multicultural firms, cultural clashes occur regularly (Hamden-Turner & Trompenaars 2012) and no specific strategy or detail was given by respondents as to how they attempted to manage them, so that a gap in employee skills development is cross cultural training.

One of the interview participants emphasised the need for more Emirati graduates to occupy a variety of job positions in a range of private industry sectors, if the UAE was to participate fully in the knowledge economy. However, one HR respondent stated the women graduates had been employed in the company but did not have the skills to collaborate with men. Generally, these remarks on culturally based conflict leave a large gap in knowledge as to how well HR personnel in UAE organisations understand the local culture and how to handle a culturally diverse workforce generally.

The issue of sourcing appropriate individuals from the labour market had forced one company to change its recruitment policy from accepting applicants, to head hunting, according to its HR specialist. This statement implies that that labour market was not providing the skills and knowledge the firm needed. In contrast, Asian expatriates were highlighted as particularly useful in the labour market by a business leader owing to their exceptional mathematics knowledge and entrepreneurial skills. These two remarks tend to align with the findings of the study by Ahmed and Abdalla Alfaki (2013) that UAE was progressing slowly to a knowledge economy, still too dependent on oil industry based manufacturing was importing rather than developing technology and technological products rather than developing them; Hameed et al (2016) reinforced this by emphasising low levels of middle and high technology business ventures. Asian and other expatriate worker continuing to be vital to the UAE economy (Eposito, Sholkamy & Fischbach 2017). The inference for this thesis is that the UAE continues to import critical skills for the Knowledge Economy as they are not readily available in the domestic market.

A response from the business psychologist is particularly important to both educational policy and practice, but it also directly links to skills required for the knowledge economy, and as Critical Success Factors (CSF) for generating future labour market needs. Strategic thinking beyond the traditional solution set and flexibility were important for managers and that, as employers, they had realistic expectations of what young people can be expected to accomplish. They should ensure that young people were given guidance as to the skills required by future labour market, and therefore the support to select appropriate options, so that they acquired a strong understanding of what role they wished to take in the future UAE

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economy. Strategic thinking of a non-traditional nature and expectation levels of your recruits appear to be skills that are indicated by Schoning & Witcomb, (2017) in a more general way and are required leadership skills as servant leadership for knowledge economy, for instance creativity and people management are complementary skills, but the specific manner in which they are expressed is not evident in the management context. The realistic expectations of young people could be associated with the remarks regarding expectations of young Emiratis to take instant management roles in their first career job. This link between leader, follower and situation aligns with the concept of servant leadership or conscious leadership that of van Niekerk and van Niekerk (2013) and responsible leadership practice (Jones & Brazdau 2015).

However, the psychologist reconfirmed the broad labour market needs as relating to individuals, who were dependable and possessed a good work ethic, and that understanding the social and emotional aspects of work and lifestyle was knowledge they needed to possess and to apply.

These remarks about the UAE labour market at the time of the first interviews, suggest that poor work ethic and cultural conflict were characteristic of it, but also that graduates in particular had a poor attitude to meeting objectives in the designated time. The cultural attitudes regarding time are also evident. Concurrently there was significant emphasis on lifestyle skills, stress management and being capable of making appropriate career decisions, for instance.

The major knowledge economy skills, both available and currently not available in the market, stated by the participants are compared with skills required in previous studies in table 16.

Table 16: Comparison on Knowledge Economy Skills and Labour Market Needs

Skills required as per Schoning 2017 & BC 2018	Skills required as per Original Interviews
Complex problem solving	**Personal skills**
Creativity	Interpersonal skills & teamwork
People management	Resilience & self-motivation
Critical thinking	Emotional Intelligence
Coordinating with others	Managing ambiguity
Judgement & decision making	Communication
Emotional intelligence	Work ethic
Quality control	Organizational politics
Negotiation	Attitude & behaviour
Service orientation	Adaptability & lifelong learning
Cognitive flexibility	Critical thinking
Active listening	Responsibility
	Leadership
	Cultural awareness
	Technological skills
	ICT
	Innovation
	Basic skills
	Writing
	Language & comprehension

This summary demonstrates that UAE business leaders require a greater variety of skills that indicated by Schoning and Witcomb (2017) and BC (2018) adding among others resilience and self-motivation, understanding organizational politics, adaptability and lifelong learning as well as technical and basic skills. These were mainly unavailable in UAE and had been mentioned as being so in previous studies as specifically indicated by the Literature Review references cite.

Company Learning & Development

The final theme relating to knowledge economy was the organisational learning and development, which was considered critical to business success. The responses from HR personnel were somewhat sparse, but an important comment was that, owing to quicker promotion into a management role, rather than up to 15 years' experience required previously, Emiratis were provided with management training to quickly gain the requisite skills. A similar response regarding management training for Emirati graduates was made by another HR specialist and the Head of HR mentioned

a specific Emiratisation programme and mentoring for Emiratis, which intended to help future leaders successfully make the transition to the knowledge economy environment. This initiative was implemented in recognition of the demand on Emiratis for Emiratis. These are useful findings and indicate that businesses are closing the gap between what is required, and the skills missing in the labour market and not provided by the current UAE education system. These findings are contrary to those of Levy and Murnane (2004) that employers did not perceive that it was their responsibility to train employees, who were lively to profit from the training and then switch employer. They also tend to confirm that UAE schools still do not develop student skills that match employer needs (Esposito, El-Sholkamy & Fischbach 2017).

The CFO stated that his company provided specific training in technical and leadership skills to all employees, Emiratis and expatriates, and implied that this was required to meet objectives, owing to cultural differences, stressing that the different cultures needed to learn respect for each other, although no specific training was given. This is an interesting confirmation of the difference in attitudes of HR personnel regarding cultural conflict and that of some employers, who recognise its significance (Hamden-Turner & Trompenaars 2012). The importance of training employees in new technology was also mentioned by the Business and Education leader, also indicating that these skills are not being developed sufficiently by schools, as was shown by the lack of new medium and high-tech businesses (Hameed et al. 2016).

The business psychologist's organisation also stressed cultural understanding as a development initiative, with the focus on encouraging different cultures to understand what values and beliefs connected them, rather than those that created conflict. This strategy was also inferred by another business leader, who mentioned that some companies did provide training on mutual respect and the company advised employees not to discuss religion as this was a private, personal matter; avoiding such discussions prevented mutual insults. This is in contrast to what Brown (2014) recommends; empathy, vulnerability and a failure accepting environment is key for a successful working environment, specifically for innovation and creativity to take place. Furthermore, a specific skill need for graduates employed by the company was training in work ethic.

The training and management offered in one industry also focused on understanding organisational values, how to communicate effectively which included becoming proficient in several technology platforms, but simultaneously learning about the requirement for confidentiality and under what circumstances. However additional learning and development opportunities were created as they were identified.

The inference of these comments is that graduates are trained in specific skills that they have not learnt prior to joining the companies, particularly in work ethics and management, with Emiratis being identified specifically by HR, whilst the CFO's company appeared to provide similar training for all nationalities. As was the case with the responses regarding skills required by the knowledge worker, the CFO emphasised technical skills, not merely behaviours and leadership skills. The implication is that the companies in which HR personnel were employed either had less focus on knowledge economy and/or their involvement in company strategy development and/or implement was very limited.

4.2.2.3 UAE Education Provision

Education Policy and School Education

Only one specific remark was made about the UAE education policy in general, which was that education was highly valued in the country. The participants' knowledge of the UAE education curriculum at all levels and the associated pedagogy varied, with one of the HR personnel admitting that s/he knew nothing about it and would have to refer the interviewer to a colleague. At school level, the detail provided was generally weak, one remark suggesting that perhaps it was less theoretical that in the past, but the CFO believed that the role of education currently had no importance to the UAE transition to the knowledge economy, because most of the skills required were learnt overseas. However, s/he stated that UAE education might be more important later, for instance within 50 years. The Head of HR proposed that no additional subjects should be added to the school curriculum except career guidance, as reported by UN (2019) as being perceived in the knowledge economy strategy adopted by the Singaporean government. These remarks tend to confirm the BC (2018) survey of business leaders, which found that the UAE government provided no means to linking educational policy makers with employers.

Success Factor School Education

The success factors in school education in terms of preparation for the knowledge economy were proposed by HR participants as ensuring that work ethic, appropriate behaviours and basic life values should be taught from the youngest age possible. This suggestion is in direct alignment with the concept of the importance of appropriate early childhood education to develop attitudes and behaviours as the brain develops (FTF 2019), particularly use of creative thinking. However, no specific detail was offered as to what the life values should be. The business psychologist affirmed that teaching children how to manage stress associated with the need for multi-tasking was a vital life skill that was critical for the modern workplace. Children also needed to learn about developing relationships, the social and emotional side of managing them, as well as self-awareness and how to ensure their personal wellbeing. The importance of teaching social skills, including teamwork which was not part of the current UAE education system, was highlighted by the CEO. These remarks similarly align with early childhood educational theory and highlight the lack of UAE governmental strategy to provide it in the public sector (Karaman 2011). Also, the imported models are individualistically focused as according to Hofstede (2010) US and UK score highly on the individualism aspect.

Educationalist should have "realistic expectations of children," according to business psychologist, who also stated that career guidance should be integrated into the school curriculum so that students were able to make appropriate decisions regarding their desired future work specialism. Career guidance was also emphasised as a vital curriculum subject by the Business and Education Leader and the Head of HR, who suggested that Emiratis particularly needed this as a curriculum subject because of the expectation that they would become the UAE business leaders. Being a leader in the current constantly changing world a leader should be able to navigate without a precis map. The previous studies by BC (2018) and the example of Singapore's Ministry of Education of instigating career guidance into the curriculum to shape students minds to knowledge economy rather than traditional careers (UN 2019) confirm the validity of these remarks.

Another factor mentioned by HR personnel and the Business and Education Leader was that the educational methods should be less theoretical than had been traditionally

the case. The business psychologist suggested that training students to improve their attention and focus was important especially as they would be subjected to a work environment, in which several tasks might need their attention simultaneously. These are skills that has not been mentioned as important in the existing literature.

The CFO perceived that elementary level education was outdated and a barrier to accomplishing the skills required for the knowledge economy, what was needed for success was building skills over time, elementary education was linked to university education (FTF 2019): "we need to change that, as skills beget skills, and this is a problem."

The Business and Education leaders also highlighted the obsolescent nature of traditional subjects in the system and the CEO that basic skills (OECD 2015) were missing from the current system.

Therefore, teacher quality was a vital success factor at the foundation stage (Samuelson & Kaga 2007), but in UAE teacher quality needed substantial improvement, in the CFO's perspective. The Business and Education Leader tended to agree and stressed the need for more Emirati teachers and staff to act as role models within the current educational system; this is stressed in the Finland (OECD 2017c) and in the Singaporean (UN 2019) contexts, both countries receiving high PISA rating for developing 21st century skills. Since students were "motivated by their own success" they should not "get overlooked", teachers need to notice potential if they were to provide students with motivation to learn more, according to the CEO. Also, Finland is not using reward and punishment systems which is considered the least self-determined form of motivation (Lipnevich et al. 2016) as discussed in the literature review part.

The Business and Education Leader emphasised that individualised teaching methods were also required for students to attain the required knowledge worker outcomes, but also in the context of learning about teamwork. Instead, rote learning was being used to enable teachers to achieve the Key Performance Indicators (KPIs). Critical thinking and use of technology must also be integrated into the school curriculum for students to acquire knowledge economy skills, however theory rather than practical application remained too common, and some form on the job training was required. In addition to critical thinking the CEO suggested that being able to analyse information, structure it

logically and build hypotheses needed to be acquired during school education and suggested that some content needed to be learned by rote. However, learning to apply theory to practical situations was also necessary. The culture of rote learning in Emirati schools was confirmed by Al Ateeqi (2009) and continues in the public-school sector in UAE (Warner & Burton 2017), which has been deemed inappropriate by UAE educationalists (Dickson, Kadbey & McMinn 2015). This issue represents both national cultural differences in pedagogy and an institutional culture of top down decision making and strategy that others implement (Al Ateeqi 2009).

The participants in the education system also needed to be more aware of how technology was changing education and business models (Warner & Burton 2017) and to ensure that the educational approach was altered to meet the new skills/knowledge requirements. The CEO stated that educationalists should take an innovate approach to education rather than a traditional one "inductive rather than deductive". The inclusion education model should also be avoided as underprivileged groups felt it created a barrier to their learning. This can be debated as inclusion is a way of social justice and the NSM in the emirate of Abu Dhabi is an inclusive model, so is the one in Finland, with the underlying believe that all children can learn (ADEC 2010b).

The lack of appropriate inspection framework for measuring personal and academic development was a weakness in the current UAE education system according to the Business and Education Leader; this was found to be the case in the study of UAE education by Warner and Burton (2017). Assessment was characterised by a universal system, which failed to focus on what success in society meant, for instance behaviour, teamwork and cultural development currently subjects such as dance and music were not assessed. Assessment by attainment, which is the basis of the PISA system (OECD 2018a) was not appropriate for creating knowledge economy skills according to the CEO, creating competition between students was more effective since it reflected the business environment and life generally, in line with the new approach in Singapore. However, in contrast to the approach in Finland where development is the goal and not excellence. The Business and Education Leader emphasised business, education and government needing to work together to define the meaning of success and therefore to develop a more effective framework to

achieve it. The success factors for school Education as identified by the respondents are summarized in table 17.

Table 17: Success factors School Education

Success Factors School Education
Early childhood education in social skills
Career guidance
Teaching of basic skills
Putting theory into practice
Teacher quality and Emirati teachers as role models
Individualized teaching
Learning of critical thinking
Incorporation of technology
Important skills & knowledge are not being taught at school level
Framework for measuring personal and academic development

Tertiary Education, Success Factors and Current Accomplishments

The main focus of participants on the tertiary education system was on graduates, with no mention of vocational education, this is typical of UAE approach to education as shown by Al Hammadi and Mohiuddin (2018). The success factors for the tertiary education sector proposed by the CFO were increasing the number of graduates from UAE universities, from the 10% contribution currently and that the university curriculum and pedagogies should reflect changes occurring in the global business environment. However, one of the HR participants suggested that locals with education at master's or doctorate level were the most sought after by UAE firms, and that qualifications were more important than any prior experience. The requirement for life skills training was also directed at higher education by the educational psychologies, wellbeing, self-awareness, relationship building in the social, emotional context and stress management. These are not emphasised in the UAE educational system.

The UAE education system does not appear to have accomplished the change required to produce sufficient highly educated young people to satisfy that requirement of labour markets as of yet, according to the business leader participants. The Head of HR stated that on the job training and specialist training was required to accomplish

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labour market needs, as well as mentoring. These facts regarding labour market shortages were reported by Esposito, El-Sholkamy and Fischbach (2017) and need for on the job training by USGov (2018).

The information gathered regarding the UAE education system demonstrate very poor knowledge of policies, pedagogies and outcomes from it, from HR personnel generally and business leaders to some point hence they do not appear to have in-depth knowledge of it.

The inference for this thesis is that there is a gap between senior business leaders, educationalist and government regarding what has been planned and its suitability for the labour market of a knowledge economy. Furthermore, business leaders deem the current accomplishments of UAE school and tertiary education to meet labour market and knowledge economy skills as low.

4.2.2.4 Strategic Partnerships

The CFO's company had a strategic partnership with local universities, specifically related to the Emirati students and to the knowledge economy, whilst the CEO's only relationship with UAE universities was as a lecturer and no indication of any influence on policies or practices was offered. The business psychologist proposed that the Airline also had such a partnership with universities but, as another department had responsibility for it, s/he was able to provide few details. No comments were made by the other participants regarding strategic partnerships other than the Head of HR who stated that the company had none. This lack of any coherent link between education and business, or encouragement by Government for one is confirmed by BC (2018).

The CFO's strategic partnership with the universities enabled the company to be involved in curriculum matters, to participate in careers fairs and to identify students to whom it awarded scholarships and other assistance. Students were also offered paid work, and this sometimes resulted in offering them a job at the end of the degree course, the only challenge to optimising the company's outcomes from current tertiary partnerships, were implied as the focus being on Emiratis only. This is a new finding, a rare example of business leader involvement with UAE education sector, but there is no evidence of any formal link, which confirms BC (2018).

University education policy has been influenced by the CFO's company by offering Emirati students on the job training and paying them a salary: "we offer students work 4 hours per week and we give them salary for that. We think it's extremely important to provide more training on the job. When these people graduate, we most probably will offer them a job".

The company also collaborated with higher education authorities to encourage them to offer an increased number of vocational education courses but had no influence on school educational policy and practices (BC 2018). The possible additional contribution that the CFO's company could make to developing knowledge economy related skills and knowledge was to encourage higher education institutions to increase workplace training interventions. At school level the company should be discussing the skills and knowledge required by the labour market on a constant basis and with the purpose of changing mental models regarding educational policy and practices. These goals could be achieved by more students gaining work experience in companies during their studies and by industry leaders having opportunities for continuous dialogue with educationalists and government bodies. This suggestion is an agreement with Gaad (2006), who states that educationalists deliver theoretical content without any reference to the context or national goals.

The business psychologist revealed that the company had some links with the universities relating to management and leadership programmes, and that they offered students mentoring. This suggests that the company may have had some influences on university educational policy.

The Business and Education leader suggested that government and business leaders could collaborate more closely, the focus on business was achieving its profit targets, and the long-term perspective taken in education did not align the short-term needs of business investors.

The inference is that the degree of strategic partnering between UAE based large companies and UAE education generally appears to be very limited at university level. The stated desire to improve the level of vocational skills, tends to confirm the findings of earlier studies (Al Hammadi & Mohiuddin 2018), as does the current lack of dialogue with the other stakeholders in the outcomes from education.

4.2.2.5 Emirati Context

The Emirati context is the final theme and relevant because UAE policy is focused on equipping Emiratis with knowledge worker skills, so as to guarantee their full contribution to its knowledge economy. Emiratis were characterised by attaining a management position after graduation by a HR participant and Emiratisation as a social issue by the CFO. However, the Head of HR felt that Emiratis experienced a great deal of pressure owing to the expectation that they would be the future business leaders of the UAE's transformation to the knowledge economy (Duncan 2018), furthermore not always receiving the needed support from their expatriates' mentors.

According to Jaques (1994) 25 years of working experience is needed in order to have parallel thinking and wisdom, as expressed by Ackoff (1989), know-how knowledge by Fricke (2009) and expertise.

Those individuals, who possess knowledge are able to accomplish greater effectiveness because they can identify patterns, investigate the reasons for them and accomplish better decisions (Boddy, Boonstra and Kennedy 2008). Therefore, it will be difficult to take on roles and responsibility without having reached this level mentioned above.

The CFO perceived no difference between the Emirati and the expatriate in terms of different expectations, nationality or type of passport was not criteria related to advanced skills and knowledge in the knowledge economy. The Head of HR also stated that the previous skills gap between expatriates and Emiratis was closing: "used to be a difference between Asians, Europeans and Emiratis however the gap between Emiratis and Europeans and other expatriates is closing."

The business psychologies proposed that Emiratis were "inspirational and effective in what they do, really impressive" but s/he was uncertain about whether this applied to the skills required for the expected contribution to the knowledge economy. They were perceived as being engaged with the current secondary school curriculum and objectives.

A stated motivation for employing Emiratis in a leadership role was that they had been educated outside the UAE, and UAE Government also sponsored this (Kamal 2018), whilst a major reason for the CFO's company not employing an Emirati was

his/her dislike of selling, with the associated avoidance of jobs with revenue or sales targets. These preferences for job roles align with the preferred collective cultural norm rather than the western individualist norm (Hofstede 2019; Weir & Hutchings 2005).The perceived lack of difference in Emirati and expatriate skills by the CFO implies that that motivation and reasons for employing or not employing either group in the company are identical.

The limited comments have value to the thesis because they provide different perspectives on the Emirati context in different companies, based on experience. Emirati leaders were likely to be graduates educated outside the UAE. However, the perception of one senior business leader is that the gap may be closing.

4.2.2.6 Role of Education

The comments made regarding the role of education focused on the suitability of imported education models. The unsuitable nature of imported educational models was emphasised by the Head of HR, they had been developed for a different context in which education was broad and young people had the opportunity to learn on the job, which was not the case in the UAE (USGov 2018). A similar comment was made by the CFO, who stressed that the UAE could create a new model but needed to identify models that were successful from other countries and learn how to adopt them in a local context (Bellanca & Brandt 2010).

4.2.3 Interviews 2018

4.2.3.1. Participant Profile

The interviews conducted in 2018, included senior managers from a range of industry sectors, as summarised in table 18.

Table 18: Participant Profile

Job Title	Profile
Head of Strategy Financial Services	Employed by a large local bank Master's in law and master's in business administration of European Universities 25 years' work experience, 10 years in UAE
Private Equity Senior Manager	Senior Manager at a local Private Equity firm Educated both in the UAE as well as at International Universities 25 years' work experience with prior experience in Financial Institutions
HR Head Mgmt. Consultancy	Employed by a Global Management Consultancy Head of HR for the Middle East Operations
Principal Mgmt. Consultancy	Employed by a Global Management Consultancy Educated in the Middle East
MD Education Consultancy	Managing Director of an Education Consultancy focusing on Sovereign Wealth Funds to build capacity, knowledge, skills and attitude of Emirati graduates entering the labour force.
MD International FI	Employed by Global Financial Services Company with headquarters in South East Asia 30 years' work experience, 10 years management executive in UAE
Associate Partner Digital Practice	Employed by a Global Management Consultancy Holder of Business Degree 15 years of work experience

The Senior Manager of the Private Equity firm stated that s/he was Emirati, and the Principal of the Management Consultancy that s/he has studied in the Gulf Cooperation Council (GCC) countries. The UAE Education consultancy was focused on developing the skills, knowledge and behaviours of Emirati graduates to meet the needs of Sovereign Wealth Fund Management. The Head of HR was an Arab expatriate worker, with more than 20 years' work experience, predominantly in GCC countries, whist the Head of International Business and the Associate Partner were Western and Eastern European expatriates. The Head of International Business had

worked previously as a management executive for a very large UAE company for 10 years of 30 years' work experience and the Associate Partner Digital Practice had completed almost 15 years of career, after obtaining a Business Administration degree. The breadth and depth of experience of these business leaders, their multicultural backgrounds, and their diverse roles in contribution to the UAE economy and the country's ambition to transform to a knowledge economy, enable this thesis to present deep insight from diverse perspectives of the role education has in accomplishing this goal and the associated skill set that is required to do so.

4.2.3.2 Knowledge Economy

Major Skills required in a Knowledge Economy

The seven participants had diverse perceptions of the knowledge economy, the common factor in two cases was that it was completely different to the traditional production context, and four referred to intellect (Bell 1999), in different way, for instance intellectual property, intellectual property development, intellectual capital, localising intellect. Economic growth (Bell 1974) was mentioned in six cases, which could be dependent on knowledge and application of intangibles rather than tangible products (Bell 1974), moving the means of growth beyond manufacturing and services, capacity to innovate, and the creation of a robust intellectual property rights framework. Intangibles were mentioned in the context of information (OECD 1996), knowledge (Brinkley 2006), intellectual property and brain power (Bell 1974), with one respondent referring to development of an ecosystem of universities to develop this intellect (WB 2018) and another proposing that the knowledge economy was vital to the business sustainability of local companies. The participant perception of knowledge economy closely resembled the descriptions given in earlier studies, but sustainability was not mentioned in any of them, rather in relation to the UAE situation needing to be changed to a knowledge economy by Mardi, Almsafir and Yao (2011).

The major skills considered as required for the knowledge economy were diverse as shown in table 19.

Table 19: Skills Required for Knowledge Economy

Personal skills	17
Attitude & behaviour	6
Interpersonal skills & teamwork	3
Critical thinking	2
Leadership	2
Adaptability & lifelong learning	2
Managing ambiguity	1
Communication	1
Technological skills	**17**
ICT	6
Big data	5
Artificial Intelligence	3
Innovation	2
Coding	1
Basic skills	**10**
Language & comprehension	3
Mathematics	3
Reading	2
Writing	2
Skills for the businesses	**3**
Retain talent	3

The skills are divided into personal skills and technological skills, but the mention of basic skills such as reading, writing, mathematics and comprehension is rather surprising and was accompanied by a comment that every other type of required skill could be learnt. Quantitative skills were mentioned and has been grouped with mathematics, because mathematics (Baker 2013) forms the basis of such skills, and it stresses long term development of the basic skill in the knowledge economy. Leadership was mentioned in several interviews, sometimes referred to also as management, for instance creating the non-hierarchical organisational structure that the participant stated was needed for the knowledge economy, in contrast to the power distance culture that Hofstede (2019) connects to UAE, and agile approach to leadership was also necessary skill and tends to align with that structure. Thought leadership infers a leader, who is able to deal with the ambiguity of an unknowable future, whilst managing the current goals and issues. Hence certain attributes of knowledge economy leadership emerged from the interviews. These tend to align with some of the characteristic of conscious leadership as being less formal, understanding

the social and economic context able to deal with ambiguous issues which often involve people (Jones & Brazdau 2015).

The context of the responses is important to the manager's perceptions of their position in the knowledge economy vision, in the case of the basic skills, the Education Consultancy was the source, and these appear to be the skills from which they develop the more advanced skills but this is not stated. The data related skills, ICT and AI were most important to the three financial services respondents and to the HR manager, two of these individuals also emphasised the personal skills of teamwork (Schoning & Witcomb 2017), leadership, communication (Schoning & Witcomb 2017) and attitude, whereas original innovation rather than then borrowed from an expatriate worker's home nation, was most important to the management consulting firm, which also stressed thought leadership; this is allied to creativity in Schoning and Witcomb's (2017) hierarchy of skills for 2020. The Associate Partner responsible for digital practices specifically mentioned coding skills, ICT and Big Data as characteristic of a knowledge economy and therefore crucial to achieving that goal. Coding was mentioned as important by Arabic parents (Salim 2017) and had been identified by Kressner (2016) as a skill that should be taught in the UAE education curriculum as well as awareness of data gathering and its interpretation. The individual organisation was perceived as requiring specific competences by the Head of International Business for the global financial company, who stated that: "equally important is that the business requires certain skills themselves which are to identify and to continuously develop talent…another crucial skill …to keep the relevant staff onboard …. staff who have the skills are highly mobile…and are ready to move to the next place".

The implication is that the organization's capacity to recruit and to retain staff with the appropriate skill sets impacts substantially on its contribution to creating the knowledge economy (BC 2018).

Current Labour Market

The level of skills in the current UAE labour market was discussed in both direct and indirect ways, the direct references to the labour market demonstrated that skills shortages were experienced in Data Analytics and AI, appropriate levels of related

ICT skills were so difficult to find that even company training was limited in closing the gap (Hameed et al. 2016). These were particularly important to two of the financial services participants and the representative of the global financial institution emphasised that neither businesses nor individuals had acquired the relevant skills and knowledge to achieve economic success because the related intellectual property had not been created. The lack of intellectual property rights affecting UAE transformation to the knowledge economy is confirmed by earlier research, for instance WIPO (2018) and Hvidt (2015).

In relation to soft skills, such as teamwork, no single definition existed because the practice that occurred was dependent on the employee's cultural origins, indirectly inferring that employees with an appropriate understanding of this skill were insufficient in number. Lack of employees with the appropriate attitude to work was also cited by two respondents. However, a mismatch between soft skills of positive work attitude and designated job role was characteristic in financial services according to one participant who stressed that young Emirati graduates had the right attitude to contribute to accomplishing the knowledge economy but were placed in bank branches in customer facing job, which failed to exploit and develop the skills that were learnt at university. The gaps in the labour market regarding Data Analytics and AI were so high that financial services were importing all the staff required from Europe and the US, expatriate workers. A similar situation existed for management consulting, which has challenges in recruiting sufficient individuals with leadership, innovation, ICT skills and had to import them instead, but labour market conditions meant that contracts were temporary and based on a specific assignment, permanent employment of imported skills was not a feature of the UAE labour market. These findings regarding importing technology and skills confirm previous research by Kressner (2016). The inference is that UAE needs to acquire critical skills for the Knowledge Economy from abroad as they are not readily available in the domestic market which is particularly relevant for ICT skills.

The participant whose focus was digital practice reconfirmed these skills gaps and the need to import such skills, but his/her organisation also outsourced contracts to other countries, which had such skills in much higher quantities (Kressner 2016; Hameed et al. (2016) in line with a gig economy discussed in the literature review. The

Educational Consultancy also reported that the fundamental skills it required to develop Emiratis for the knowledge economy were rare in the labour market, mostly they were imported. However, those Emiratis who had strong skills were sometimes granted international scholarships inferring that this was a local remedy to diminish skills gaps in talented Emiratis (Kamal, 2018). The HR manager from a service company made a similar statement that talented Emiratis employed by it has all been sponsored to study outside of the UAE, and overall UAE did not produce sufficient individuals to meet the needs of private companies (BC 2018; Esposito, El-Sholkamy & Fischbach 2017). An associated remark was that if the UAE's wish to compete as a knowledge economy was genuine, it was mandatory to give substantial attention to developing the relevant skills in the entire domestic workforce, both Emirati and expatriates. The position of Emiratis in the labour market was described by one participant as generally as concentrated in certain industries or Government, with some individuals holding senior management positions in large companies, but s/he had not experienced their involvement in technology related jobs, which was his/her specialist area. These comments about Emirati work preferences and employment choices converge with other studies, such as Esposito, El-Sholkamy and Fischbach 2017; Duncan 2018).

Company Learning & Development

The third theme in Knowledge Economy is the current training and development offered by employers and establishing why it is considered critical. One of the financial services managers, mentioned on-the-job training, cross-functional assignments and attending selected conferences, the rationale was explained as: "Against the background of digitization our industry is changing rapidly and therefore the skillset required as well. We strongly believe in lifelong learning to keep our staff and therefore our company competitive".

This response demonstrates the companies are implementing knowledge transfer skills such as recommended by Nonaka and Toyama (2003) and a commitment to lifelong learning (OECD 2008) inferring that employees, including new graduates have not sufficiently develop them in formal education, as reported by OECD (2008).

Lifelong learning was also a skill encouraged by the educational consultancy and the global financial institution, and for the consultancy this included developing self-

learning skills to ensure the individuals long term employment sustainability, to make the individual aware that having a degree was insufficient in the contemporary environment, constantly updating skills was mandatory (The Partnership for 21st Century Skills 2011). A similar reason was provided by the global finance representative who highlighted and rapid obsolescence of certain skills in the knowledge era, so that individuals and organisations must be constantly exposed to new concepts and ideas, international mobility was an intervention that the firm used to support this type of continuous learning. Hence industry leaders' views on the importance of lifelong learning to transformation to the knowledge economy converge with The Partnership for 21st Century Skills (2011).

In both management consulting firms, sending employees to train overseas (Kamal 2018), providing international assignments and working in a range of industries, were also a major practice, as well as developing their people management skills in house. These remedies were crucial to retaining employees, remaining relevant to clients and to ensuring continuous skills development by involvement in a range of challenges in a variety of contexts. Lifelong learning was a common theme in most responses, so that skills remained relevant to the business and client needs, but the HR manager also stressed the specific importance of adding value by means of devising various interventions to ensure skills sets alter as the external environment changes.

4.2.3.3 UAE Education Provision

Education Policy and School Education

One of the financial services executives considered that the Government was very active in promoting diverse skills sets, for instance at public school level it has revised the curriculum to accomplish this. The success of the UAE Education Policy was dependent of the breadth of the curriculum at every stage, so that students were introduced to different skills, according to one of the financial services participant and a similar comment was made by the Education Consultant who stated that: "the education system needs to drive performance by establishing clear standards which need to be met in order to advance to the next academic level starting from primary levels."

Furthermore the Education Consultant's remarks stressed that the educationalists and Governments should concentrate on the outcomes they required, and shape education to accomplish them, quoting the Singaporean model as being ideal because the Government had identified engineering and technology as the most important sectors, and the national curricula was designed specifically to meet these labour market needs as confirmed by Economist (2018) and OECD (2016, 2017a). Along similar lines, another financial services participant stated that the current education policy was not sufficiently aligned with the UAE's economic vision or with labour market needs, inferring school and tertiary level country limitations, which is confirmed by the OECD (2018) report on the PISA ratings of UAE schools.

According to the researcher the NSM, as discussed in the literature review chapter, has a many feature to it aligning with 21-centuty skills. The students who have received the NSM education will be part of the PISA results in 2018 which will be published in December 2019 and it will be interesting to see if there has been a progress due to the same.

Success Factor School Education and Tertiary Education

Similarly, the respondents working for the global financial company and the international consultancy proposed that the success of the UAE education system depended on generating young people who had acquired proficiency in basic skills (OECD 2015), critical thinking and the desire for life-long learning to match the

continuous change in the external environment, ICT skills needed to be learned from primary school level. However, according to Warner and Burton (2017), the UAE education system was not developing such skills sets

Greater success would be accomplished by Government and educationalists identifying the skills requirement for each key industrial sector, in order to create the school and university educational curriculum that would generate the outcomes required by business and the knowledge economy, according to a financial services participant. The mandatory Arabic curriculum at public school level was also identified as needing to begin very early, so that foundations could be developed sufficiently for competence required at university level (FTF 2019; BAECE 2012). Skills and knowledge in mathematics was also considered to be a vital competence for the knowledge economy, and required more emphasis so that outcomes were higher, a comment that aligns with the view of UAE business leaders in the BC (2018) study. The mathematics capability was especially lacking among Emiratis, according to the Education Consultant whose agency focused on Emirati skills development. Hence this remark may also apply to expatriates in the UAE system, which the agency does not train, especially as OECD (2018) reports poor mathematics results in the PISA (2015) tests for all UAE schools. Another success factor emphasised by two participants, with finance and training specialisms, was that schools needed to differentiate between students with skills and intellect for university education, and that university scholarships should be awarded on a merit basis; neither was the current practice. Another limitation to current accomplishments was that the impact of the education system had not extended to persuading Emiratis being given opportunities to use the skills gained in an appropriate private company, this was therefore identified as a success factor by a finance executive. Further success factors promoted by two of the financial services managers, were that the Government educational reforms must change the Emirati mindset of preference for employment in public sector rather than private or semi-private firms, this had not yet occurred. These comments on lack of change in employment preferences was confirmed by Eposito, El-Sholkamy and Fischbach (2017).

One of the firms had recruited non-Emirati Graduate trainees because no Emiratis applied for job vacancies. Emiratis who had acquired skills for working in the

knowledge economy, such as collaborative communication skills, were those who had studied outside rather than in the UAE: a remark made by two participants, one emphasising the Emiratis holding senior positions had this attribute (Kamal 2018). At tertiary education level, the second financial services executive suggested an additional gap between public and private universities in respect to their contribution to meeting labour market needs, diminishing of which would lead to greater success: "Government universities focus on training Emiratis to take up roles in the government and they have a clear view of what skills are required to work effectively in such roles. Private Universities at the same time seem to be a bit detached from the business and government."

A critical success factor at university level, according to the digital practice expert was to foster aspects of teamwork across cultures. These perspectives tend to be in alignment with Playfoot and Hall (2009) regarding the theoretical, traditional basis of UAE higher education. The success factors for School and Tertiary Education as identified by the respondents are summarized in table 20.

Table 20: Success factors School and Tertiary Education

Success Factors School and Tertiary Education
Align educational curricula with skills required by Businesses
Teaching of basic skills
Access to Universities on a merit basis
Change preference for public sector employment
Teamwork across cultures

Accomplishment School and Tertiary Education

In terms of current accomplishment of knowledge economy goals, the Education Consultant stated that current education models at primary level, were not successful in producing the outcomes to make the transition to the knowledge economy.

The same perspective was expressed regarding primary education in particular, which was suggested as failing to prepare students for university, because the necessary foundations were not being achieved to ensure student success in an academic environment; specifically, the academic models were not generating the required knowledge, skills and behaviour. This response aligns with the educational theory that early childhood education is vital to develop attitude and habits (BAECE 2012).

This is somewhat confirmed by previous studies, which state that teachers do not have the resources for implementing enquiry led learning and have not been involved in any decision making, may not have the motivation or training to alter pedagogy (Tabari 2014; Branine 2011) and the inspection system is not adequate (Warner & Burton 2017). There is also the suggestion that public schools are more likely to have these issues, and this many also relate to the suggestion by Cuban (2013) that the current model does not incorporate local principles.

The Education Consultant also remarked that tertiary level courses had evolved into academic rather than implementing the required practical approach (Playfoot & Hall 2009; Al Hammdi & Mohiuddin 2018).

The global financial company participant suggested that individuals could only become proficient in applying the skills learnt by exposure to a business environment, which tends to support the need for the practical pedagogy. However, s/he had also observed some improvement in skills, but the educational approach had failed to change the Emirati mindset of a preference for public sector employment (Duncan 2018); these remarks were also made by the consultancy partner specialising in digital practice. Improvement in quantitative, critical thinking skills and interpersonal skills was noted by HR Manager.

The Management Consultant perceived that higher education was producing a limited supply of talent, and that graduates did not always have the skills sets needed by the local labour market; this was also stressed by the Head of International Financial

Business and by the digital expert who proposed that the skill set accomplished was not that required by the knowledge economy; the comments are in agreement with OECD (2017a). In contrast the, global financial consultancy executive stated that Emiratis had developed the skills that were required for accomplishment of UAE vision and the HR manager that the perception of skills improvement was sector related, for instance oil and gas companies could find the skills they needed. These contrasting views tend to confirm that the Emirati preference for certain job sectors remains (Duncan 2018).

An interesting observation, which is linked to the rating of the UAE as a global economy was the "the outstanding professors are keen to publish internationally which is channelling it out of the UAE." The implication is that some academic staff are negatively impacting on UAE progress towards being upgraded in its status as a knowledge economy because academic research is published outside the country rather than being recognised as an improvement in previous status. This was somewhat reinforced by another participant who had observed that NYU Abu Dhabi had begun to conduct its research outside the UAE. The lack of marked improvement in the UAE's rating for research activity and patent registrations (WIPO 2018; Hvidt 2015) provides some credibility to these remarks and may well be disadvantaging the country.

A complementary remark regarding achievement at tertiary level was made by the Education Consultant, who suggested that education inflation was occurring because there was no robust selection procedure for entering university and the outcomes in relation to the depth of knowledge and skills acquires was not consistent; this remark is somewhat justified by the low pass rate in English and the ongoing requirements for a Foundation Year to enable Emiratis to gain university acceptance. However, one of the financial services participants proposed that UAE graduate students of all nationalities had relevant skill set to participate in the local economy, which suggests progress has been made by educational reforms at tertiary level.

In regard to research and vocational and technical education, five participants stated that there were unable to make any comment, as they had little knowledge of UAE policies and interventions; one had no contact with vocational education. The implication of these comments may be that these educational aspects were not highly

rated (Jackson 1968; Cedepof 2008; Al Hammadi & Mohiuddin 2018). This view was reinforced by the Management Consultant who had no direct linkage with research and suggested that all research was government funded research. The limits of research were also highlighted by a financial services participant who stated that his/her firm had commissioned international research agencies with local representation, or customer field studies by local companies, rather than UAE universities and that s/he was not aware of new graduates employed in either research organisation; this was affirmed by the HR manager and the digital practice expert, who also added that research was also completed overseas (Kamal, 2018). Vocational and technical education was delivered by specialist schools according Management Consultant, but student demand for such training was extremely limited (Pennington 2017; Eposito, El-Sholkamy & Fischbach 2017) The Education consultant confirmed the limited progress made by reforms to embrace these higher education sectors, re-emphasising the lack of alternative direction regarding career and further learning given to students, instead university was emphasised even for those for whom it was not appropriate. This resulted in a lack of appropriately skills individuals for non-graduate jobs that contributed to the knowledge economy goals. These remarks are similar to those made in previous studies for instance Pennington (2017) highlights that vocational courses are focused on completing their school education in Year 10 and the very low number of students participating (Al Hammadi & Mohiuddin 2018).

4.2.3.4 Strategic Partnerships

Collaboration with UAE Government and Educationalists

The strategic partnerships that the participants had developed with the tertiary education sector were: Business Analyst Programme offered by the Management Consultancy and intended for new Emirati graduates and the Private Equity executive stated that a local bank had employed more than 100 graduates as part of the Emiratisation campaign. This implies that Emiratisation is being focused on some of the knowledge economy industries that the UAE has targeted to make its transformation from the rentier economy (BC 2018).

One financial services respondent and the Educational Consultancy appeared to have had no direct interaction with the tertiary sector; recruitment of new graduates for full-time or internships was the strategic partnership focus of three other participants. This more represents the general situation, which was discovered by the BC (2018) survey of business leaders.

The global financial company, international consultancy and the service sector firm had all developed graduate recruitment policies with universities, allocating a number of work positions, but in two cases, the number of university was limited to a selected few universities and two international universities with no approach to local universities in the latter case. The international consultancy offered internships to graduates irrespective of culture, which were perceived as an opportunity for them to gain insight into its business and the associated skills needed for career development. The service sector firm recruited new graduates and provided company-based skills training programmes. These initiatives are company led inferring that the private companies are focused on obtaining the limited group of students with the required skills before the enter the labour market, which currently lacks sufficient of them (Malone, Laubacher and Johns 2011).

The global financial company, international consultancy and the service sector participants also stated that a significant challenge to furthering the partnership to support the achievement of the knowledge economy vision was that Emiratis did not want to work in the private sector owing to the working hours, lower pay and benefits but the digital practice expert revealed that expatriates had ambitions to becomes

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entrepreneurs rather that follow a corporate career, and that the firms they initiated would not be in the UAE. The global financial executive commented that the firm may have created a barrier to Emirati graduates by offering a specific job rather than emphasising the career opportunities. Similarly, the HR manager felt that the firm's policy of offering graduate job after graduation was too late to influence employment in the private sector, in other words it should be engaging with students earlier in the degree course. These remarks suggest that UAE business leaders have recruitment difficulties with attracting expatriate and Emirati graduates, for different reasons, the global financial expert implying that greater understanding of what motivates Emiratis to a career was required, and expatriates with digital skills possible fail to perceive innovation opportunities with UAE firms, which could be related to the lack of research partnerships and Government generated platforms to link firms, universities and Government as found by BC (2018). The HR Manager's remark is highly relevant to this lack of educational focus on content delivered to knowledge economy needs (Gaad 2006).

In general, these comments demonstrate the very limited partnerships that most of the firms participating in this research have with the universities; the focus is graduate recruitment with some associated skills building interventions. In some cases, graduate recruitment is very limited, a small number of selected partners, and in one case, the purpose is alignment with the Emiratisation policy for the banking sector and in the other local universities are excluded from the firm's partner preferences (Schiliro 2013; QAA 2017). No mention is made of strategic partnerships involving joint research projects or exploiting the skills of private sector experts to teach at universities, or to advise on the curriculum or practical applications of it.

One of the companies had formed a strategic partnership to help the UAE Government to shape educational policy, the Management Consultancy. At the school educational level, it had given advice to the relevant ministries regarding how to develop education policies and the economic vision. The Management Consultancy executive has also advised on developing university educational policy and teaching methods in relation to the knowledge economy goals. However, there was very little collaboration between Government and business leaders with regard to vocational and technical educational policy and pedagogy, remarks were made such as uncertain

from the Management Consultant, and none from other participants. None of the three financial services executives or the educational consultant had any collaborative arrangements on educational matters at any level with the UAE Government.

These findings, which are similar to those of the BC (2018) survey, have several implications, including the impression that the Government has not considered private industry appropriate for providing advice on educational policies and methods of appropriately implementing it and, therefore, it has failed to provide the opportunity to generate the networks of schools, universities, businesses and research as suggested by knowledge economy theoretical principles (WB 2018). Two companies, the international consultancy, the service organisation were unable to comment on any strategic partnership relating to tertiary education, stating that their assignments were confidential.

Opportunities

The opportunities envisaged from the partnerships with the universities were expressed by one of the finance executives representing a major bank, as creating dialogue between the universities and UAE United Banking Federation comprising all banks and their relevant sub group including compliance departments to promote opportunities for talented graduates in the sector. The second finance executive stated that the opportunity had been to encourage Emiratis to join the banking sector and that they were able to evaluate Emirati graduates as very well educated and motivated young people, who were willing to participate in the private sector. The international consultancy perceived that the internships it offered were an opportunity for new graduates to gain insight into its business and the associated skills needed for career development. This initiative is likely to reflect the lack of career guidance in the education system, so that individual companies need to provide it so that they can attract the suitable graduates that are motivated by the firm's values and objectives.

Challenges

The challenge encountered by the Management Consultancy to developing these partnerships was that limited interest in the private sector was shown by Emiratis because of the perceived long working hours. This was somewhat reinforced by the private equity executive, who stated that "we witnessed a substantial attrition as the

graduates felt they couldn't make use of their skills in an optimum way". However, whilst no further details were given by the participant, the differences in cultural values regarding western and local work environment and work ethic may be partly responsible for this outcome (Ali 1996; Najm 2010), and further research into this concept seems to be required, given the emphasis placed on cultural conflict in these sets of interviews.

Contributions and Practical Interventions

The additional contributions that businesses make to the current UAE education system so that sufficient individuals were available with the required skills, knowledge and attitudes for the private company workplace were restricted according to the Management Consultant because the main barrier was "talent will prefer to work in global knowledge economy hubs rather than in the UAE".

Since the banking executive had no previous strategic partnership with the UAE Government, s/he proposed a contribution of initiating dialogue between the parties to create a mutual understanding of what business required and the Government's investment plan, allowing alignment of educational strategies to accomplish both outcomes, by means of suitable curriculum development. The private equity executive highlighted the important cultural aspect that companies needed to address, precisely that, in the financial services sector, there were very few second generation Emirati bankers so their families were unlikely to provide any information about the sector, meaning that corporates should be closing the gap by providing an understanding of the knowledge and skills required for such a career. Businesses were aware of the need to collaborate with universities to develop practical skills but were unwilling to invest resources to do so, according to the Education Consultant, who proposed that would be an appropriate business contribution to generating more graduates with the required skill sets. The global financial company executive suggested that the government should be making the contribution to business not the reverse, firms needed to be encouraged to develop individuals rather than recruit new employees with relevant skills. "From my point of view the question is the other way around what incentives can the government give to business to make contributions to the education. Business tend not to invest into staff but recruit someone from the outside

with the relevant skills, which turns out to be more effective and cost efficient. This is a reflection why UAE is not at the forefront of a knowledge economy".

The same respondent believed that practical interventions were not realistic as the student skills and knowledge set for a knowledge economy was not available in the UAE and, since businesses in the country competed on a profit rather than a talent basis, the opportunities for individual development were non-existent. The degree of investment in employee skills in the UAE was lower than international standards and that large knowledge-based companies should be the most important Government focus, and skills developed for it irrespective of nationality.

In the remaining six cases, a range of contributions were expressed by participants, for instance two suggested that private business could ensure sufficient future talent with the required attributes by supporting the sponsorship programme that developed talent outside the UAE and one added that they should encourage it to return having acquired relevant skills and knowledge. However, the Educational Consultant proposed that the business should be teaching the required workplace skills in a practical environment, this was not the universities' role, academics should provide the knowledge foundation; the two aspects and their provision should be separated, as a practical environment was needed for learning how to apply knowledge. The inference from this remark is that collaboration between industry and universities is not well represented in the UAE (BC 2018).

In a complementary suggestion, the financial services executives believed that more collaboration between the universities and schools was needed with their sector to ensure that school level students and new graduates were provided with sufficient information, to enable them to select from a wide range of employment options. "Corporates need to build alliances with the schools …a well-defined …continuous dialogue with the aim of nurturing the next generation of bankers…with the relevant up-to-date skills and offer them then a relevant job to make good use of these skills".

In a similar context the Associate Partner working for the consultancy and the HR Manager, suggested a range of interventions from giving guest lectures, providing internships, sponsoring students to providing support to shape a more effective curriculum and delivery of it.

4.2.3.5 The Emirati Context

The first question related to the comparative skills and knowledge regarding Industry 4.0 of Emiratis and Non-Emiratis in education and the workplace; the responses are summarised in table 21.

Table 21: Skill Comparison

Participant Sector	Emirati	Non-Emirati	Reasons for Difference
Associate Partner Digital Practice	Low skills	Low skills	No difference but situation a result of universities has not embraced the concept of Industry 4.0. Talent is imported and/or developed overseas
Head of Strategy Financial Services	Almost non-existent skills	Almost non-existent skills	Focus on business administration and economics, no emphasis on these skills at university level
MD Education Consultancy	In workplace basic idea	Relatively more competent in workplace	The geographical location of education received
Private Equity Senior Manager	No response	No response	No response
MD International FI	Do not exist	Do not exist	
Principal Mgmt. Consultancy	Very limited	Very limited except in specific cases	If expatriate has taken a degree that specialises in these technologies, s/he may have skills
HR Head Mgmt. Consultancy	Only in specific cases	Only in specific cases	Most degree courses do not include these technologies

The remarks suggest that at the UAE education level, there is little difference between Industry 4.0 knowledge and skills of Emiratis and non-Emiratis, neither group will have knowledge or skills unless their courses have specialised in Industry 4.0 technologies. Previous research suggested this only apply to Emiratis (Esposito, El-Sholkamy and Fischbach 2017), and this response indicates that schools are generally not developing sufficient numbers of individuals, these skills as reported by Esposito, El-Sholkamy & Fischbach (2017).

However, in the workplace, there is a marked gap in skills because non-Emiratis acquired their competences with technologies outside the UAE. Additional comments on Industry 4.0 knowledge and skills were made by the banking executive who reported that some primary schools had started to offer programming classes and,

therefore universities were lagging behind primary education, as Kressner (2016) found no evidence of universities developing these skills sets.

A general enquiry concerning the overall impact of Emirati skills and knowledge that has resulted from the educational reforms yielded diverse responses. The Management Consultant had observed a definite improvement in their skills, with schools and universities delivering higher level English language skills and more comprehensive learning in other subjects. A limitation on accuracy of this perception was that s/he had few interactions with new Emirati graduates, as a high proportion of the total continued to seek Government related employment; this traditional employment trend was a consequence of a mismatch between the education system and the UAE economic vision, according to the Education Consultant; aligning with previous findings of Gaad (2006). However, the private equity financier and the global financial company executive had also observed a significant positive change in the required skills possessed by Emirati, basic skills in English, writing and attitude has been noted, but the private equity respondent remarked that they needed to be given opportunities to apply their skills in an appropriate role in the private sector. The digital practice expert had a different perspective, observing no improvement in Emirati skill set suitable for the knowledge economy also remarking that Emiratis did not tend to participate in technology related industries at any level. The mixed perspectives suggest a range of experience in employing Emiratis, which is likely to be a consequence of their continued preference for certain job sectors and/or lack of understanding of how to motivate them in a manner that aligns with local cultural values. In either case the outcome is that further studies are required to assess the role of cultural divergence as barrier to Emiratisation and Emiratis occupying high level positions in the UAE knowledge economy sectors.

The interviewees were specifically asked to comment on employment criteria for Emiratis in the private sector, specifically motivators for employing them and those that would deter their employment, with the specific reasons for each. The responses are summarised in table 22.

Table 22: Motivators and Deterrents for Employing Emiratis and Expatriates

	Motivator Emiratis	Motivator Expatriate	Difference in reasons for employing or not employing expatriates or Emiratis
Associate Partner Digital Practice	Requisite skills and commitment	Required skill set available	Many young expatriates not remaining in UAE for long term, which limits the investment companies are willing to make in them
Head of Strategy Financial Services	Emiratis fully competitive with non-Emiratis in terms of skill set Government mandate that a certain number of Emiratis be employed, participation increased	None given	Employment cost of Emiratis. Government pays higher salaries than private sector Some companies cannot afford the salaries expected Emiratisation rules favouring Emiratis
MD Education Consultancy	Appropriate skills, knowledge and attitude	Appropriate skills, knowledge and attitude	Unrealistic expectation of graduates at start of career in workplace
Private Equity Senior Manager	No specifics given	No specifics given	No specific differences in motivators and deterrents. Emirati expectation of longer hours, less attractive private company pension schemes and sometimes lack of cultural diversity in private sector are self-imposed deterrents.
MD International FI	Interested in private sector employment	Their salary expectations are lower than those of Emiratis	Emiratis generally prefer public sector and expect the higher pay and benefits it offers
Principal Mgmt. Consultancy	Interested in public sector employment, difficult to attract them	Easier to attract them	UAE businesses do not consider that it is their responsibility to train required skills and therefore recruit individual who already possess them
HR Head Mgmt. Consultancy	To respond to Government quota for Emiratis	Lower cost	Both types of new graduates lack experience so less attractive to employer. Emiratis expect higher salaries

The common theme in the responses was that the preference of Emiratis for public sector employment, benefits and cultural environment made a career in that sector much more attractive than a private sector career. This also had an impact on private

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companies recruiting Emiratis because, in some cases the additional salary cost was prohibitive. However, some sectors such as financial services were required to employ a quota of Emiratis by UAE law and the skill sets possessed by them appear to be appropriate for that sector, according to the private equity executive. In contrast, if the Emirati had the required skills set and attitude, s/he would equally as employable as a non-Emirati. Highly educated and skilled non-Emiratis were also considered to be a high cost risk for private companies, because of their tendency to remain in the company for a short period of their careers and, therefore investment in them was restricted. This factor has not been emphasised in previous studies and is important since there appear to be cost and risk factors for employing Emiratis and expatriates, but for different underlying reasons.

The international consultancy and the UAE service company representatives both emphasised the lower employability of new graduates than experienced ones, with the international consultancy participant explaining that in UAE there was no private company culture of employee skills training; the employer expectation reflects the remark made by the global financial firm executive that UAE firms competed on profit and required government incentives to train new skills.

The inference of this remark and the cost and risk factors is that UAE should be more active in supporting company training and development, since its educational policy is not generating sufficient numbers of skilled young people to meet the demands of the labour market, yet is cannot achieve its aims of transforming to a knowledge economy in the short term, without private companies willing to initiate the requisite development initiatives. In essence, the lack of any strategic partnership between industry, education and government is a hindrance to UAE meeting its economic goals.

4.2.3.6 Role of Education

The comments made by the participants regarding the Role of Education provided some extra valuable information. The participants reinforced the role of education in enabling the transformation of UAE to a knowledge economy, but that Business and Education leaders have a different view of the specific role of Education.

According to one interviewee the predominantly private education provision, which was focused on profit, with UAE goal accomplishment as secondary, illustrates this tension. One participant stressed that businesses would deliver the UAE knowledge economy vision not education, and another two interviewees stated that business leaders understood that the skill sets they required were narrower than those envisaged by educationalists whose objective when designing educational policy was to benefit society as a whole. The Education Consultant stated that the role of Education and the Role of Business in delivering the Knowledge Economy is fundamentally different: "The role of Business is to leverage and to develop the assets of human capital once it leaves the university. The university needs to provide student with the basic skills of mathematics, writing, reading, comprehension and attitude in order to give them the opportunity to work and to develop have the staff to develop"

Along similar lines one participant highlighted that: "Education leaders see the role of education more in supporting the overall vision of the country of social and economic advancement but to lesser degree to equip student with the practical skills required in the labour market. Business leaders on the other hand see education as a source of employees with the right skill sets to help the business to generate a profit."

Whilst the UAE education policies have been evaluated by the participants, three remarks were made that they needed to be altered to reflect cultural and religious traditions, whilst three others, one from an Emirati, suggested that they should be amended to do so. However, the HR Manager believed that cultural adaption was not required, instead the educational policies and practices were not suitable for driving a knowledge economy transformation and should be adapted to integrate skills and knowledge related to Industry 4.0 technologies. These two perspectives, reflect the conflict of viewpoints that have been expressed several times: that a local cultural perspective has not been integrated into the educational policy, and that some employers may have negative perceptions of Emirati attitudes because they have not considered the different fundamental values of Emiratis and expatriates (Ali 1966; Najm 2010; Dixon & Dougan 2004; Georgas, van De Viverf & Berry 2004). In the educational sense this is a consequence of adopting western based educational models but also working practices from overseas, which have been considered necessary to transform UAE to a knowledge economy (USGov 2018).

The Private Equity interviewee also emphasised that transition to the knowledge economy would be a huge advantage to the UAE because digitisation reduced the number of employees required and, since the Emirati population was small, investment in providing them with skills could be high. Hence there was a specific UAE development policy to equip Emiratis with digital skills and hence to retain local leadership in this technology and its application. In regard to the imported educational models (USGov 2018), one participant described the UAE model as being reminiscent of 1950's American education, and that international global leading universities based in UAE promoted educational policies and practices that aligned with the business leaders' requirement, such that business leaders in UAE had more advance thinking on education than the UAE tertiary education policies and practices displayed. This may be the situation, although this study has not focused on the differences in educational policy and practices between local and overseas universities, because it was outside the scope of this thesis. The study by Playfoot and Hall (2008) suggests that this may be the case and therefore merits further research.

4.3 Summary of The Qualitative Results

An overview of the qualitative results along the thematic analysis is provided in the table below and discussed in detailed below in table 23.

Table 23: Summary Qualitative Results

Theme	Summary
Knowledge Economy	• Personal skills, technological skills and basic skills are all critical in a Knowledge Economy, • Early childhood education and life-long learning stress the importance of Education in a Knowledge Economy, • UAE education system is not producing sufficient employees with the required skills, • Shortage of skills domestically results in importing skills from overseas.
Education Provision	• Business Leaders have a limited understanding of the Education System in the UAE and its initiatives • Business Leaders deem the current accomplishments of UAE based schools and tertiary education facilities to meet labour demand for the Knowledge Economy as low • Business Leaders stress the importance of alignment between the Economic Vision, labour market needs and the curricula both at school and tertiary level • The need for merit-based admission to university and a stringent assessment methodology for personal and academic development was highlighted • UAE has not established a research-based culture and hence continues to fail to register intellectual property rights, • Preference of Emiratis for public sector employment, benefits and cultural environment made a career in that sector much more attractive than a private sector career • Vocational studies in the UAE are almost unknown to Business Leaders, • Teacher quality, their development and the absence of Emirati teachers as role models was identified as a key gap
Strategic Partnerships	• Strategic Partnerships between UAE Government, Education Sector and Business Leaders is minimal • Business Leaders identified the opportunity of entering a dialogue but have limited investment appetite and are focusing mainly on graduate recruitment

Emirati Context	• Emirati prefer public sector work due to its attractiveness
	• A deeper understanding of the cultural preferences of Emiratis is required to strengthen their contribution to the Knowledge Economy
	• The skills, behaviours and knowledge of Emirati graduates has increased
	• Industry 4.0 skills are not available and need to be imported
	• The temporary assignments of Expatriates cause challenges to the transition into a Knowledge Economy
Role of Education	• Business Leaders acknowledge the importance of Education albeit have divergent views from Educational Leaders regarding its role
	• Imported Education models need to be adapted to local cultural norms and have to reflect the requirements of a Knowledge Economy

Knowledge Economy

A major difference can be observed in the skills and behaviours that participants considered as being required for the knowledge economy from the first to the second set of interviews. Lifestyle skills including stress management and personal well-being, innovation capacity, entrepreneurship, adaptability, strategic thinking and decision-making lifelong learning capacity and work ethic were important to the initial participants. In contrast, a strong focus on technological skills was evident in the second set of interviews, ICT skills, data interpretation and mathematics as technically most important, plus a positive attitude to UAE knowledge economy as a mindset. Therefore, differences between the groups and with the previous studies were evident. Types of leadership and core skills are also emphasised, which were both considered important in the older interviews. Therefore, there was less difference in the soft skills than cited for technical skills over the period, but the focus on skills for life in the multi-tasking fast changing context of knowledge economy business is very important and foreseen by two of the original interviewees; stress management, able to balance several activities simultaneously, managing personal relationships and personal lifestyle. The capacity to acquire the requisite attitudes and behaviours at early childhood level is also important for UAE future educational policy, both groups also emphasising learning skills for work as early as possible; this strategy is also recommended by educational experts (FTF 2019).

The shortage of labour market skills did not appear to have lessened between the first and second interviews, the common themes were continued importation of skills from

overseas, because the UAE education system was not producing sufficient employees with the required skills, and the tendency to send young Emiratis overseas to acquire requisite skills set continued. However, a major difference was that Emirati skills levels were considered to have been much improved in the later interviews, in contrast to the first interviews but the problem of Emiratis adjusting to the work environment remained an issue. The lack of intellectual property rights registrations is a serious concern, which suggests that UAE has not improved its capacity for innovation and patent registration (WIPO 2018).

Education Provision

The second set of interviewees appeared to have more knowledge of the UAE education system than the first group, but neither had knowledge of the vocational system in any detail. However, both groups agreed that the UAE educational system was not producing sufficient numbers of individuals with the skills sets required by the labour market. The Singaporean educational model was stressed as more suitable than the UAE model by a second group interviewee, who identified the involvement of business leaders in educational policies and practices.

Teaching quality was mentioned by both groups, specifically the lack of connection between the curriculum content and the knowledge economy goals and the highly theoretical context, which was mentioned by the first group. One participant suggested education was not needed to deliver the knowledge economy, whilst in the later discussions a remark was made that industry must deliver it. However, the shortage of appropriate skills was a common theme and in the first and second set interviews.

The lack of Emirati teachers was emphasised in the context of Emiratis potentially getting overlooked in the education systems and their potential not being recognised and nurtured in the initial interviews. In the second set of interviews, the tendency for universities to enrol students and/or to award scholarships to those that did not have the appropriate academic achievement was mentioned as a barrier to knowledge economy skills set attainment. Hence remarks were made by both groups regarding the poor assessment methodology.

The participants in the second interviews, stated that there was no research culture in the UAE universities, and a further remark that any research that was being pursued was reported by non UAE academics outside of the country, so that the UAE was not gaining any credit for it.

Strategic Partnerships

Although there was greater involvement of business leaders in the second interviews, this was mainly limited to recruitment strategies to identify the best talent, rather than impacting on course content and delivery. Both groups reported lack of formal mechanism by Government to link industry and educational policies as a means to deliver the knowledge economy.

The opportunities of creating dialogue between the UAE Government, the Education system and Business Leaders was highlighted in the second set of interviews. While Businesses were aware of the need to collaborate with universities to develop practical skills but were unwilling to invest resources to do so due to their short-term focus on profit and practice to recruit the required skill sets from abroad.

Emirati Context

The main point made in both sets of interviews were the drawbacks for the Emiratis joining the private rather than the public sector due to longer office hours, lower salaries and different pension schemes as well as a lack of cultural diversity in certain companies. Increasing the attractiveness of private sector work remains one of the most challenges of integrating Emiratis into the Knowledge Economy.

The cultural conflict between having multicultural environment is also a major theme in both sets of interviews, both between employee groups, and employer and employee. In previous studies little attention was given to the possibility of gaining knowledge, as two participants inferred in the second interview set, of Emirati motivations regarding career and the workplace environment were required.

The conflict of focus in the UAE workplace was identified in the first interview set, with HR personnel failing to identify or to give attention to soft skill development needs of new graduates, because their cultural norms integrate expectation of skills possessed by expatriates, whereas business leaders may have a broader perspective.

For both Emiratis and Expat workers the interviewees in both sets highlighted that Industry 4.0 skills were not available and needed to be specifically recruited from overseas. Regarding the overall impact of Emirati skills and knowledge that has resulted from the educational reforms responses were diverse suggesting that the Educational reforms have improved skills, behaviour and knowledge of Emiratis but not the same wasn't observed consistently. The gap of skillsets between Emirati and Expat graduates who studied in the UAE was perceived to have narrowed over time. It needs to be mentioned that the UAE has created the 'Fourth Industrial Revolution Council' specifically for the Industry 4.0. The Ministry of Education (2018) The Ministry of Education will support the Government's strategy and focus on among others AI, IoT, deep learning, self-driving cars, machine learning, robotics, and blockchain. This will support UAE nationals to apply their knowledge, skills and learnings into research papers and solutions for real-life problems. As this program is being implemented further research should be made regarding the same.

The challenge of the UAE attracting talent from overseas for a limited period of time was identified in the both sets of interviews; as a result, first interview set discussed the lack of motivation expat mentors had in developing both Emirati and Expat staff. Additionally, the motivation of Expatriates to help to develop the Knowledge Economy and the transfer of skills to the domestic workforce was questioned by interviewees.

Role of Education

The participants reinforced the important role education has in enabling the transformation of UAE to a knowledge economy. However, Business and Education leaders have a different view of the specific role of Education; whereas Business Leaders see Education as a supplier of practical skills which are required for generating profit Education Leaders are of the view that Education serves a greater good. Furthermore, the suitability of imported education models was questioned due to the difference in cultural norms and due to the perception that they were based on a traditional division of labour and not reflecting the requirements of a Knowledge Economy.

4.4 Analysis of Quantitative Data

The questionnaire was distributed to 267 individuals. 138 responses were received, and 133 individuals completed the personal details section of the survey, whilst only of 103 respondents filled out the entire questionnaire. Therefore 103 questionnaires of the 267 distributed were fully completed, representing a return of 38.5%, which is a reasonable return rate since Baruch and Holtom (2008) state that 35.7%, with a standard deviation of 18.8, is a good response when participants are top managers or belong to an organization.

4.4.1 Demographics of Questionnaire

A profile of the participants was developed from the questionnaire, 52 females and 81 males declared their gender, in percentage terms this represented a ratio of 39.1% to 60.9%. In a global context the gender distribution would have been expected to comprise 50% female and 50% male participants (Pallant 2010). However, the UAE population is not gender balanced, GOVae (2018a) reported an overall population of 69% males and 31% females in 2016.

The age profile of participants is graphically represented in figure 16, with more than half being in 36-45 years age group and one quarter in the 46-55 age group.

Figure 16: Participant Age Profile
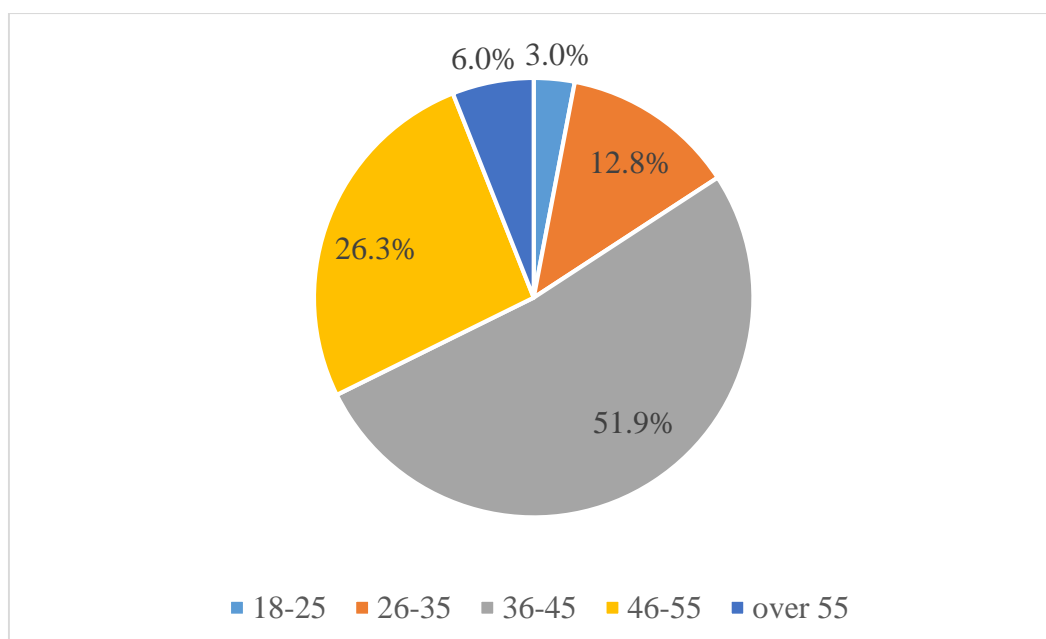
The most influential age group for this study is therefore 36 to 54 years. and this somewhat aligns with overall population demographics, which show that the majority of working age population ranges from 25 years to 54 years representing 70.4% of all those living in UAE (CIA 2018); in this survey 91.0% population is in the 26 to 55 year age group, which is reasonable since the general population figure is not the same as that of the workforce and official data is very difficult to access. In this survey there was also focus on senior and middle management participation, so that the groups 36 to 45 years and 46 to 55 years are likely to be more prevalent, and this is verified by the job groups that participants indicated, 73.7% in management roles but 33.8% of the total were senior managers as show in figure 17.

Figure 17: Participant Job Roles
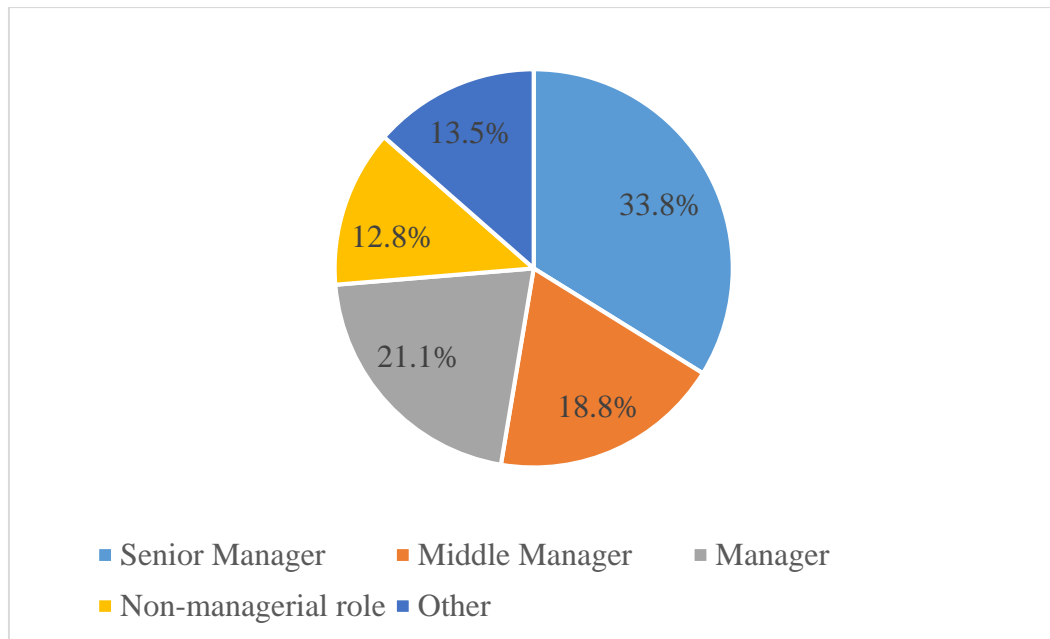
The proportion of UAE and non-UAE participants was also determined, with the split being 27.1% to 72.9%, in contrast to the reported workforce population demographics of 91.1% expatriates to 8.9% Emiratis (Kumer 2018). From the perspective of this thesis the inference is that there will be a substantial Emirati input, and this is highly relevant to answering the research question, whilst simultaneously gathering perspectives from foreign nationals working in mostly management roles; a balanced view with sufficient Emiratis to generate a variety of their opinions.

The length of service in the current organisation also indicates the range of experience that the participants have accrued about their employment and the associated UAE labour market, the nature of which is important to this thesis in terms of existing and desirable skill levels and skill sets.

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Figure 18: Length of Service
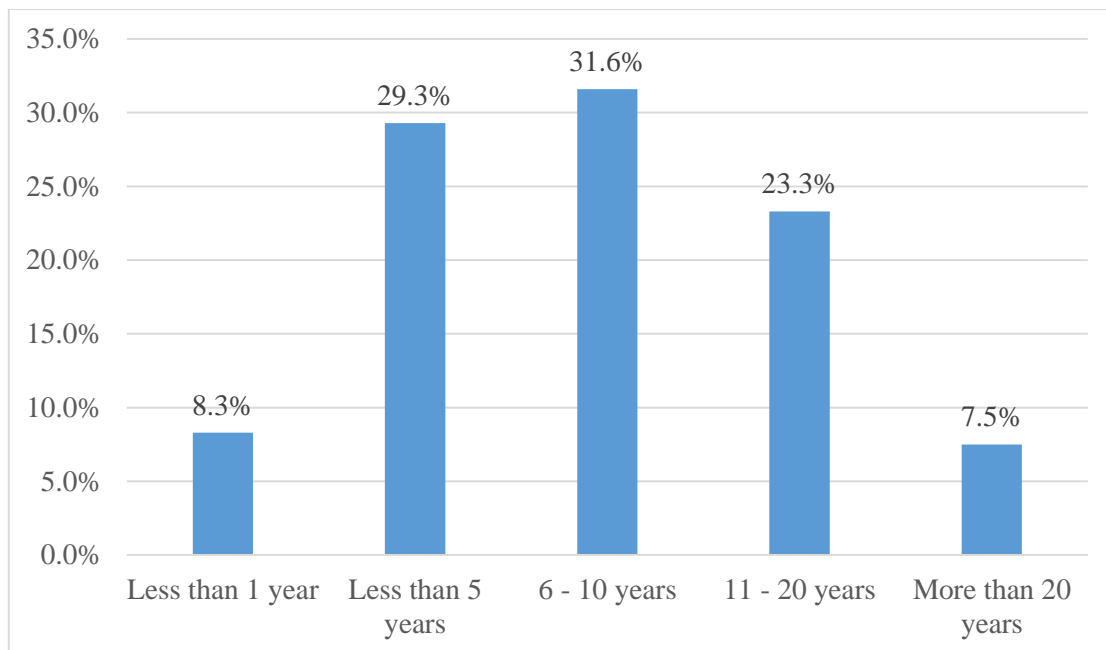
The participants' length of service profile suggests that a range of perspectives of UAE labour market will be provided, with some respondents being able to comment based on their long term participation in the UAE labour force environment, but also those more recently employed in their firms will have experienced recruitment from the labour market in the recent past, and be able to provide recent insight from a job candidate rather than a recruiter perspective.

Educational experience is an indicator of both the level of qualifications of managers and other employees and implies that they will have perspectives on the current UAE education system, based on own educational background and those of the people they manage. The data also indicate the extent of educated managers operating in UAE. The responses demonstrated high level qualifications 68.4% with a master's degree of higher, 12.8% of all participants holding a doctorate, figure 19.

Figure 19: Participant Highest Qualifications
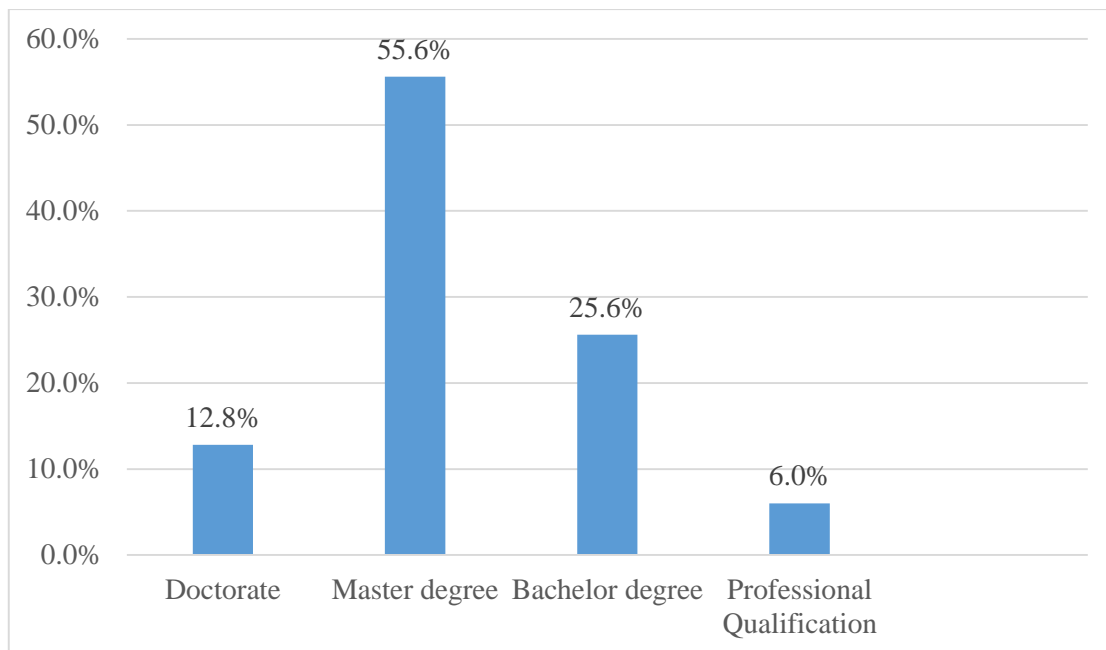
Whilst 25% had a bachelor's degree only 8 respondents or 6.0% held a professional qualification, which is interesting and aligns with data from the Literature Review, which suggested that vocational qualifications were not well developed in UAE, and student participation in them was low (Al Hammadi & Mohiuddin 2018). The high level of qualification also somewhat reflects previous studies regarding Emiratis, who represent 27.1% of participants, tending to be highly educated because those participating in the labour market tend to be employed at medium and highly skilled jobs (Eposito, El-Sholkamy & Fischbach 2017).

The last two profile questions concerned the industry in which the participants were employed and their specialist role within the workplace. The objective of these two questions was to assess the extent of reach of the survey in terms of industry sectors, which could also be a source of knowledge relating to UAE's selected knowledge economy sectors, the participants understanding of skill-sets available and required from both their sector and own specialism.

The survey offered participants a choice of 19 industry sectors to match to their current employment, or to indicate that they were not currently employed as, only five were unemployed at present, and the remainder were distributed across all other sectors. The Finance and Financial Services sector had the highest participation 18.8% to which insurance could be incorporated and provided a total of 22.6%. Before

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looking into the other 80% it needs to be highlighted that Financial services have a central role in all economies. Education was the next highest sector, 24 participants and 18.0% of total. All sectors are shown in figure 20.

Figure 20: Employment by Sector
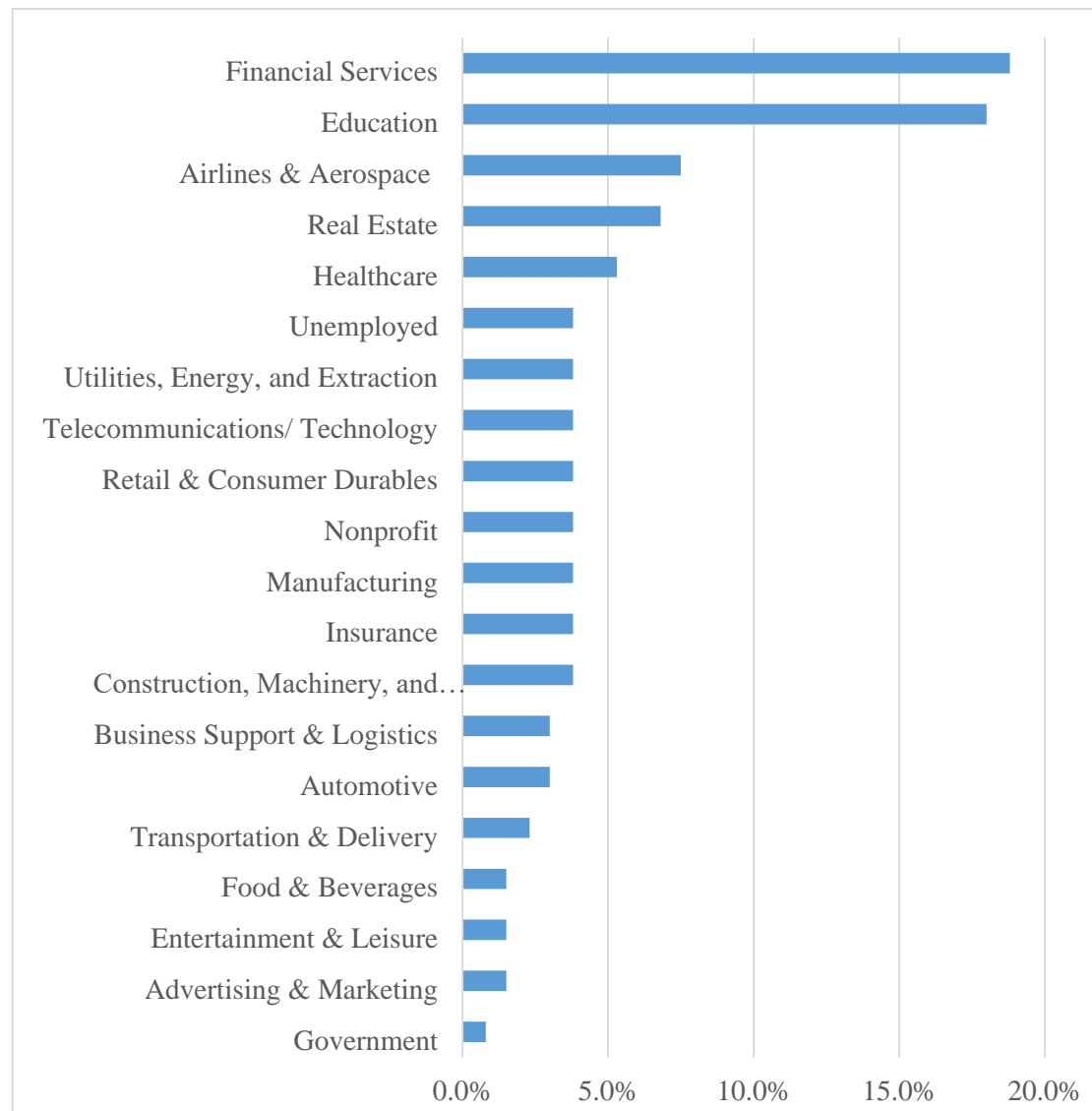
Airlines and aerospace were the third highest sector represented with 7.5% or 10 participants, Real Estate and Healthcare having the fourth and fifth highest participant numbers. Business support included logistics and telecommunications integrated technology, internet and electronics, whilst healthcare also represented pharmaceuticals. Therefore, if the public sector is excluded, this range of industry sectors participating in the study tends to represent the current UAE labour market environment (Gulf Business 2018).

In relation to the UAE's objective of transforming to a knowledge economy based on manufacturing, travel and tourism, trade and logistics, financial services, technology, media and communications, and energy and petrochemicals (BC 2017), this survey is dominated by financial services opinion. In addition, 12 participants are engaged in trade and logistics if transportation and retail are added to business support, approximately 9% of all respondents, energy by 3.8%, technology and manufacturing each by 3.8%, and media and communications represented by leisure and advertising by 3% total. Petrochemicals was not a separate category and is often integrated into manufacturing in the UAE. Hence, 42% of those who completed the survey work in the chosen knowledge economy sectors. The high proportion of educational workers must also be stressed, since it demonstrates that substantial input was obtained from the sector and therefore some balance between industry and education in responses is to be expected.

The job specialism question revealed that few participants were focused on new technologies, information technology or innovation, 6%, 3.8% and 1.5% respectively, finance and human resources were the most represented at 9% each, figure 21.

Figure 21: Participant Job Specialisms
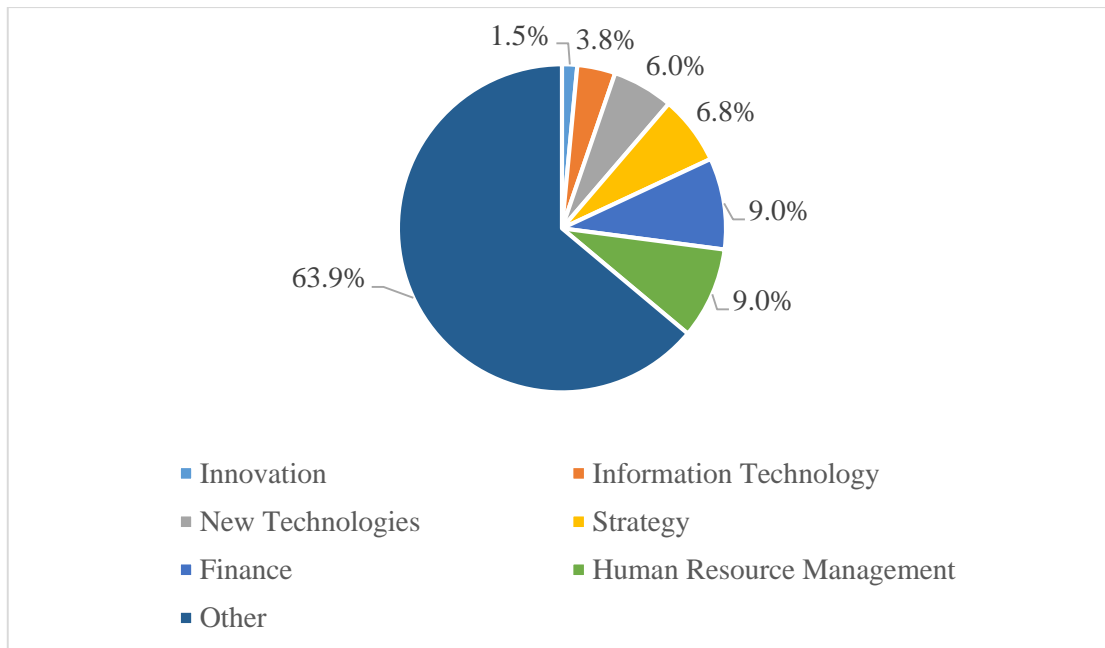
This finding appears significant in terms of the UAE striving for a knowledge economy, which requires high technology and innovation skill levels, but few participants indicated them, just 11.3% (New Technologies, Information Technology & Innovation). This may be related to the Hameed et al. (2016) research, which showed slightly negative growth in middle or high technology business ventures from 2006 to 2011.

The participant profile can be summarised as being relatively representative of UAE labour force, it is strongly representative in terms of the male and female ratio and of the dominance of financial services as a major industry sector, but specifically in relation to this thesis, it also represents education well to put the study in context. The age profile also mirrors that of the UAE labour market situation, and the job role and length of service profile suggest that the survey has captured those individuals who have a very good understanding and knowledge of the current UAE labour market and the skills sets available to them currently. The high level of qualifications suggests that the education level of those entering the workforce is vital to accomplishing management roles, and that diverse opinions on education will be held by respondents. However, an apparent gap exists in the job specialisms that participants have declared, which infers that primary employment expertise in technology, information technology and innovation may be lacking. This could be compensated

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by the relatively high participation of Human Resource Managers and Strategists, who should theoretically have substantial knowledge of labour market needs in these specialisms as the driver of the UAE's transformation to the knowledge economy.

4.4.2 Questionnaire Questions

The main survey questions had the purpose of testing five hypotheses.

HI: The most critical skills for creating and sustaining a knowledge economy are similar to previous studies

In the literature review two previous studies, namely BC (2018) and Schoning (2017), identified critical skills in a Knowledge Economy. Table 24 gives the ranking of critical skills across the two previous studies.

Table 24: Critical Skills in a Knowledge Economy as per previous studies

Rank	Critical skills	Mean
1	Complex problem solving	2.0
2	Creativity	3.1
3	People management	3.3
4	Critical thinking	3.6
5	Coordinating with others	3.7
6	Judgement and decision making	4.8
7	Emotional intelligence	4.9
8	Quality control	6.0
9	Negotiation	7.4
10	Service orientation	7.5
11	Cognitive flexibility	8.4
12	Active listening	9.0

This hypothesis was tested by comparing the six most critical skills identified in earlier studies with the ranking of critical skills by the respondents. The importance of skills in the questionnaire determined by observing the mean values of the rankings 1 to 12 given to each of the possible skills in question 11 "The soft skills required for a knowledge economy". The overall outcomes are represented as a bar chart in figure 22.

Figure 22: Ranked Order of Skills
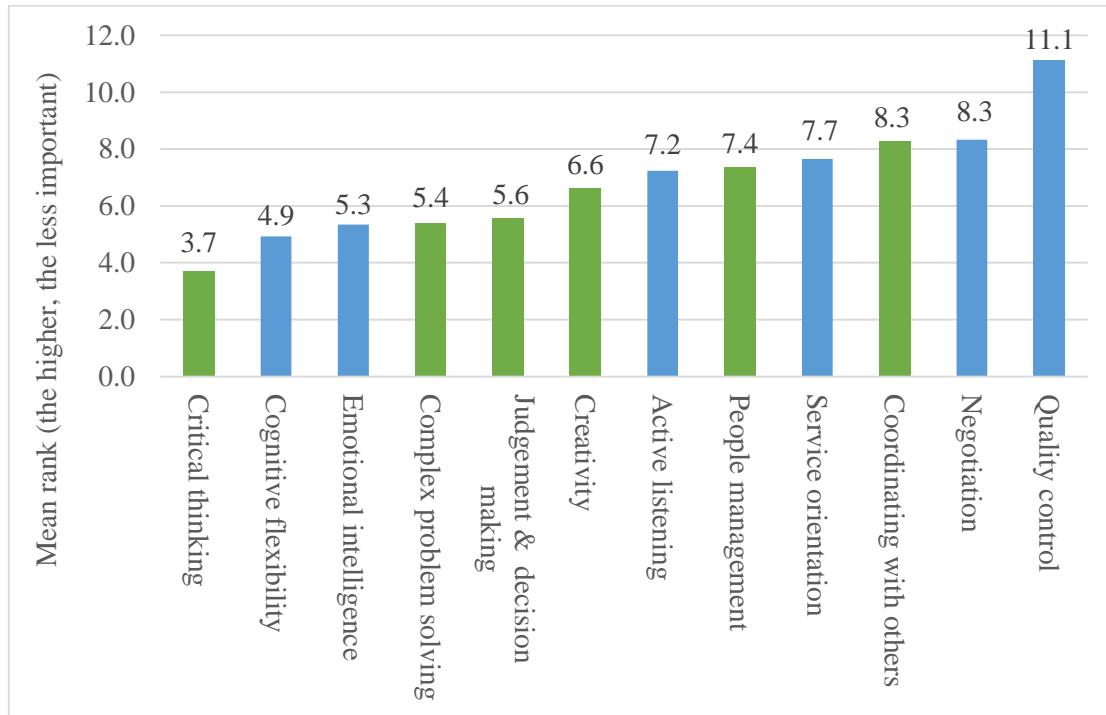
The green bars represent the skills which were identified as critical in previous studies.

The lowest score represents the most important skill in this analysis, since the participants ranked 1 as most critical and 12 as the least critical of the twelve options, and it is evident from the mean rankings that the participants considered critical thinking and cognitive flexibility as the most important skills, with emotional intelligence and complex problem solving in third and fourth place with very similar scores.

The values of standard deviation from the means were highest for service orientation, coordinating with others, creativity with standard deviation values of 3.63 to 3.53, suggesting a wider range of opinion than was present in the case of negotiation, critical thinking and judgement and decision making, which were approximately 2.4 to 2.7.

- Therefore, **H1 is accepted** because participants rate similar skills as critical as identified in previous studies such as BC (2018) and Schoning and Witcomb (2017), namely four out of the top six. Only Cognitive flexibility and Emotional Intelligence were not ranked highly in previous studies but identified by respondents as critical. For Schoning and Witcomb (2017) the similarity in skills identified increases depending on the timeframe; while for 2015 similar skills have been identified, the survey participants predicted a shift in the skill-set required for 2020. The similarity in skills identified between the questionnaire and the 2020 skills according to Schoning and Witcomb (2017) increases and highlights that Emotional Intelligence will be critical in 2020.

H2: The required critical skills in the UAE's transition to a knowledge economy are NOT available

The participants were asked to tick every skill that they considered was missing in UAE labour market, thirteen options were given in question 13 "In your experience, which of these soft skills are NOT WIDELY available in the UAE labour market". These skills, which have been identified as critical by respondents in question 11 were therefore amongst those that should be promoted and embedded by the UAE educational policies and practices. Therefore, the responses to this question provided an indication as well of whether the current educational system delivered them or not.

The responses were ranked according to the number of ticks each received, 58 was the highest and 5 the lowest; the bar chart in figure 23 shows the relative lack of each skill. A higher score indicates the lower availability of the skill in the market.

Figure 23: Skills not provided by Education in UAE
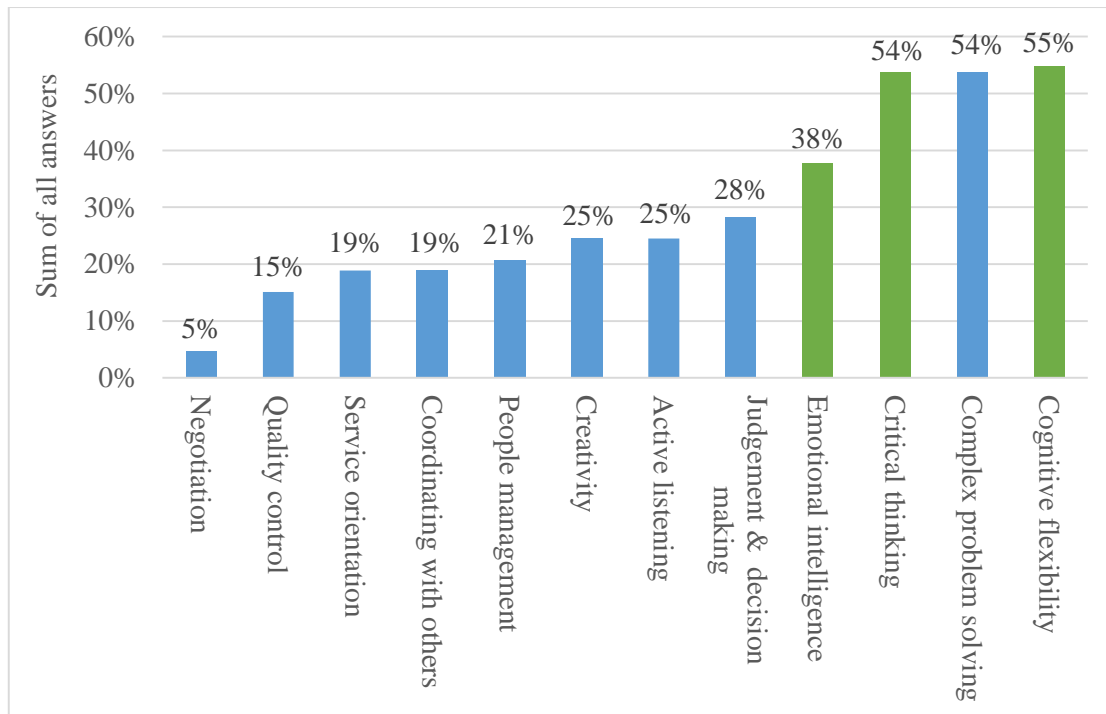
The three most critical skills as identified by respondents are highlighted in green. Critical thinking and complex problem solving received the joint second highest response from 54% of respondents but cognitive flexibility had the highest rating from 55% of participants, emotional intelligence gained a high rate, 38% considered it missing. Negotiation, quality control and service orientation all appeared to be relatively easy to find in the current labour market.

- Two out of the three most critical skills were missing according to at least 50% of respondents, and the third most critical skill Emotional Intelligence was missing according to 38% of respondents, accordingly **H2 is accepted**.

Similarly previous studies in the UAE such as BC (2018) identified that graduates lack essential skills to effectively participate in the job market. The study mentioned critical thinking, communication, creativity, team work as particularly lacking. These skills are similar to the ones identified by the questionnaire participants.

H3: The local and national UAE universities DO NOT generate graduates with the requisite skill set to meet current and future labour market demand

This hypothesis was tested by the responses to question 14 "Concerns the outcomes from the current UAE Educational Reforms in terms of their impact on the labour market", which was a rating question, in which the respondents were asked for their degree of agreement or disagreement with a number of statements regarding university level education in the UAE. In the analysis a score of 1 was given to strongly agree and 5 to a choice of strongly disagree; The statements and mean responses scores are shown in table 25, with their respective standard deviations.

Table 25: Outcomes UAE Educational reforms

Statement	Mean	Standard Deviation
The UAE educational reforms foster development of skills the labour market requires	2.8208	.75337
Teaching methodology in the school education system is appropriate for developing knowledge economy skills	3.0000	.90501
The changes in the school curriculum support future labour market needs	2.7075	.82770
The skills required by the labour market have improved as a result of educational reform, in the case of Emiratis	2.4906	.87554
School leavers and university graduates have adequate technology skills and are able to apply them well	2.9623	.82721
Teaching methodology in the higher education system is appropriate for developing knowledge economy skills	2.9623	.76749
The educational reforms have ensured that more highly qualified and skilled are available in UAE labour market each year	2.5849	.92446
The skills required by the labour market have improved as a result of educational reform, in the case of young expatriates educated in UAE	2.6698	.77732
There is inadequate vocational education provision in the UAE	2.8558	.81751
The UAE local universities have developed a research culture	3.2075	.85876
University course remain too theoretical so that graduates are not ready for the workplace	2.7264	.86776

Since a score of between 2 and 3 represents a neutral position, of neither agreeing nor disagreeing with the statement, these outcomes demonstrate that respondents are indifferent regarding most of these statements. Scores over 3 indicate some level of disagreement with the statement, this is evident for the statement, which suggests that

universities have developed a research culture. Therefore, a lack of research culture is perceived as somewhat true by some participants, and the lack of agreement regarding this statement is suggested by its high standard deviation value of 0.8677. The Cronbach alpha was measured at 0.741which indicates a reliable result (Giem & Giem 2003). Whilst teaching methodology in schools, which provide students for universities, has a mean of 3, there is a slight indication that participants do not think it appropriate for developing knowledge economy skills; this has the second highest standard deviation so that it can be assumed that there is some dissatisfaction with teaching methodology as suitable for developing labour market skills.

- However, overall, most statements accrued a value of 2.5 to 3.0 so that hypothesis. **H3 cannot be rejected or accepted** as respondents seem to be indifferent.

Previous studies such as Eposito, El-Sholkamy, & Fischbach (2017) reported that private sector employers state that both the required skills and attitudes are not adequately generated by the UAE education system. Specifically they highlighted that additional resources are required in the field of research to maintain and increase UAE's competitiveness while ICT and digital literacy need to be expanded outside education and into the workplace.

Warner and Burton (2017) mentioned that the School inspection frameworks remains inadequate, due to their focus on standardized tests in mathematics, science and reading and thereby indicates that the teaching methodology is not fully appropriate for developing knowledge economy skills and that in particularly the efforts to develop students with problem solving, critical thinking and life skills required in a knowledge economy need to be reviewed.

H4: The critical success factors for school and higher educational establishments to support the knowledge economy are NOT in place

Testing this hypothesis was achieved by utilizing question 15 "Critical success factors for school and higher educational establishments to support the knowledge economy". For the success factors which were identified as critical by respondents the level of satisfaction was evaluated in table 26.

Table 26: Critical success factors for school and higher educational establishments

Critical success factors for school and higher educational establishments to support the knowledge economy	Critical success factor	Yes - currently satisfactory
Teacher quality	76.92%	15.38%
Integration of technologies in teaching methodologies	61.02%	40.68%
Students employ latest technologies as a learning tool	64.91%	42.11%
Students develop work ethic and values	71.67%	30.00%
Students develop appropriate behaviour	65.57%	31.15%
Student centred exploratory learning	46.67%	26.67%
Learning tasks required solutions that apply critical thinking	67.86%	21.43%
Students collaborate to solve problems	66.67%	36.84%
Students engage in cross curricula projects to promote connected thinking and knowledge sharing	67.69%	27.69%
Awareness of new technologies, for instance robotics and artificial intelligence	75.95%	17.72%
Science, Technology, Engineering and Mathematics taught by enquiry led learning and research	68.18%	22.73%
Multi language capability	66.67%	50.00%
Advanced computer skills, for example coding, handling data, software	68.35%	21.52%
More Emirati role models in education system	46.34%	14.63%
Adequate resources for practical work in science and engineering subjects	54.72%	28.30%
Emirati culture and traditions integrated into curriculum and approach to learning -	43.75%	33.33%

Most factors other than 'Student centred exploratory learning', 'More Emirati role models in education system' and 'Emirati culture and traditions integrated into curriculum and approach to learning' were identified as critical. For the critical factors the satisfaction score is generally below 50% other than 'Multi language capability'

- Given low satisfaction levels of significantly below 50% for critical success factors required to support the Knowledge Economy **H4 is accepted**

Previous studies such as Tabari (2014) confirmed that teachers play a crucial role in the implementation of large-scale educational reforms, while teachers resistance to implement change is not primarily due to the adaptation of Western policies to a local

cultural context but resulted from previous studies such as Tabari (2014) confirmed that teachers play a crucial role in the implementation of large-scale educational reforms, while teachers resistance to implement change is not primarily due to the adaptation of Western policies to a local cultural context but resulted from practical and professional concerns. Furthermore the study highlighted that teachers were not adequately involved in decision making, resources provided proved to be unsatisfactory and that the demand to implement several projects in parallel was mentioned. Additionally teachers mentioned that limited opportunities exist to exchange experiences and that the underlying rationale of the reforms were never explained to them. Furthermore the study highlighted that teachers were not adequately involved in decision making, resources provided proved to be unsatisfactory and that the demand to implement several projects in parallel was mentioned. Additionally teachers mentioned that limited opportunities exist to exchange experiences and that the underlying rationale of the reforms were never explained to them.

Warner and Burton (2017) Furthermore major perceptions why educational goals in the UAE are not being met include teachers employ traditional pedagogies of rote learning and memorising facts, high turnover of educational leaders, too few qualified and experienced Emirati faculty.

H5: Business leaders in the UAE have NOT formed diverse types of strategic partnerships with UAE Government and universities to ensure that curriculum design and outcomes meet future labour market needs

The statements comprising question 16, rating questions, were critical to testing this hypothesis, a score of 1 given to strongly agree and 5 to strongly disagree, mean values and standard deviations are displayed in table 27.

Table 27: Business Leaders' Strategic Partnerships

Statement	Mean Value	Standard Deviation
My firm collaborated with the UAE government and educationalists in school curriculum design and planning teaching methods, to ensure that young people gained the skills required by future UAE labour market	3.0283	0.98036
My company collaborated with the UAE government and educationalists in university curriculum design and planning teaching methods to ensure that young people gained the skills required by future UAE labour market	3.0660	1.01671
A representative of the company participates in school/higher education teaching activities in the classroom	3.1226	0.96316
My company works collaboratively on research initiatives with universities	3.1226	0.94317
The company advises government and providers on vocational education initiatives	3.2547	0.86257
Companies are not encouraged to advise on educational policies and practices	3.2762	0.77825
The company offers on the job work experience as part of the university degree programme	2.7736	0.95900
My organisation is willing to make a higher contribution to ensure that the right skills are developed at school and higher education level	2.6442	0.83513

The responses are all in the range of 2.5 to 3.27 so that no very strong agreement or disagreement was found as an overall conclusion. The Cronbach alpha was measured at 0.834 which indicates a reliable result (Giem & Giem 2003). The second statement regarding companies collaborating with government and educationalists to design curriculum and plan teaching methods has the highest standard deviation, implying that some firms were involved, and others had no involvement at all. The highest means of 3.2762 (Companies are not encouraged to advise on educational policies and practices) and 3.2547 (The company advises government and providers on vocational education initiatives) indicate that generally companies are not encouraged to advise neither on educational policies and practices nor vocational educational initiatives.

- **H5 is accepted** in terms of that Business leaders in the UAE have NOT formed diverse types of strategic partnerships

Similarly BC (2018) stressed the importance of employers, educational authorities and institutions collaborating and regularly exchanging ideas on developing the skills needed in the UAE knowledge economy. Based on their findings the no platform exist by the Ministry of Education for bringing all stakeholders including the employers together in order to identify and develop the relevant required skills for knowledge workers during the formal educational system. Further the study highlights the need of involving the private sector in the definition of the curriculum on a continuous basis

4.5 Summary of the Quantitative Results

The questionnaire findings are particularly important because of the representative nature of the participants, a group of leaders from the business and education sectors with a composition that mirrors the range of industrial sectors, Emirati and expatriate workforce, highly qualified individuals able to provide a range of perspectives on the current labour market environment in the UAE and having insight into its future skills needs.

The major findings of the quantitative study were that:

- the skills needed for the UAE knowledge economy are similar from those suggested by previous studies conducted both outside and inside the UAE but differed somewhat in ranking,

- the required critical skills for transition of the UAE in a Knowledge Economy are not fully available,

- it's unclear to what degree schools and universities generate adequate supply of graduates to meet the labour market demand,

- the critical success factors for school and higher educational establishments are not in place,

- and that business leaders generally do not have strategic partnerships with UAE Government and Universities.

Out of five hypotheses tested leveraging the responses collected in the questionnaire, four are accepted and only hypothesis 3 cannot be rejected or accepted as shown in table 28. This outcome demonstrates a substantial congruence with both sets of interviews and largely confirms the views of the interview participants.

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Table 28: Summary of the Quantitative Results

Hypothesis	Outcome Questionnaire
H1: The most critical skills for creating and sustaining a knowledge economy are similar to previous studies	**H1 is accepted** because participants rate similar skills as critical as identified in previous studies, namely four out of the top six. Only Cognitive flexibility and Emotional Intelligence were not ranked highly in previous studies but identified by respondents as critical
H2: The required critical skills in the UAE's transition to a knowledge economy are **NOT** available	Two out of the three most critical skills were missing according to at least 50% of respondents, and the third most critical skill Emotional Intelligence was missing according to 38% of respondents, accordingly **H2 is accepted**
H3: The UAE schools and universities generate **DO NOT** graduates with the requisite skill set to meet current and future labour market demand	However, overall, most statements accrued a value of 2.5 to 3.0 so that hypothesis. -> **H3 cannot be rejected or accepted as** respondents seem to be indifferent.
H4 The critical success factors for school and higher educational establishments to support the knowledge economy are **NOT** in place	Due low satisfaction levels of critical success factors required to support the Knowledge Economy **H4 is accepted**
H5: Business leaders in the UAE have **NOT** formed diverse types of strategic partnerships with UAE Government and universities to ensure that curriculum design and outcomes meet future labour market needs	**H5 is accepted** in terms of that Business leaders in the UAE have formed not formed diverse types of strategic partnerships

CHAPTER FIVE: CONCLUSIONS

5.1 Chapter Overview

This Chapter represents a review of the entire thesis, commences with a summary of the research objectives and methodology, and then presents the key findings, and discusses how these helped to test the hypotheses and to answer the research questions. The recommendations are reported based on theoretical and empirical findings, followed by their implication from a theoretical, methodological, empirical, practical and an educational perspective. The limitations of this study and the scope for further research are suggested with the associated rationale, and the Chapter ends with a concluding note regarding what the thesis claims to have added to the existing knowledge.

5.2 Study Summary

The main objective of this research was to obtain a much deeper understanding of how education was perceived to offer a means of developing a knowledge economy skill set, and the extent to which that was being accomplished in the UAE, according to business leaders.

This researcher was motivated to conduct the study in order to extend her master's thesis that focused on the implementation of the inclusive NSM in the Emirate of Abu Dhabi which was a case study based on teachers' perspectives as well as experience in education and various international business environments.

The initial background and motivation for the research were devised to generate the research questions, with research hypotheses being shaped after the conceptual framework had been completed in the first part of the Literature Review. The theoretical concepts considered most vital to answering the research question were identified as: the meaning of knowledge, how it was transferred and therefore formed the basis for a knowledge economy; definition and characteristics of a knowledge economy; policy making, educational policy and policy making for the knowledge economy; national and organisational culture.

The second part of the Literature Review was related to the UAE and its ambition to transform to a world class knowledge economy, the progress it had made so far in

terms of education and innovation level outcomes, and an overview of the impact of education reforms.

Mixed methodology was employed to answer the research questions over a longer period of time. This was accomplished by two sets of semi-structured interviews with UAE business leaders, who were employed by large multinational firms and included Emirati executives. The first set of interviews was held in 2016 and the second set in 2018. A quantitative survey was distributed to 267 multi-level managers and professionals employed in UAE in 2019 and achieved a 38.5% response rate. The convergence of the three sets of findings also demonstrate the reliability and validity of the research. The qualitative data from the interviews was coded using the Mayring (2014) system to ensure high systematic rigour, and then analysed by reference to the defined codes this will add to the trustworthiness of the study. The quantitative survey was analysed, and conclusions were drawn:

The major findings were that

- Critical skills required for transformation to the knowledge economy compromise personal, technological and basic skills as well as behaviours, and the education on the same needs to commence in early childhood,

- UAE is importing critical skills from overseas and that a deeper understanding of Emirati culture is required to increase their contribution to the knowledge economy,

- Education professionals need to gain a deeper understanding of the challenges and opportunities at hand and their role in resolving them. This needs to occur in interaction with Business Leaders and government to ensure alignment with labour market needs,

- UAE Government has the opportunity to create platforms between Business Leaders, Education leaders and the Government itself to enable close collaboration and alignment between all stakeholders.

5.3 Key findings

This research sought to resolve four major questions, which will be considered separately by employing the major research findings and the progress made towards the knowledge economy goals indicated by the quantitative study. The first and second interviews will then be presented as an additional research outcome. The qualitative research provided an in-depth insight into business leaders' perspective and the quantitative research confirmed most of findings except hypothesis H3 as participants seem to be indifferent. The key findings have been summarized in table 29.

Table 29: Summary of the Key Findings

SQ1: Which skills, knowledge and behaviours are required in UAE's transition to, and continuing development of, a knowledge-based economy?	
Outcome Interviews	**Outcome Questionnaire**
• Skills required in the Knowledge Economy go beyond technological skills and include personal skills, and importantly basic skills and behaviours as well, • Skills and behaviours need to be instilled at a young age which stipulates the importance of early childhood education.	• Critical skills identified in this study align with previous studies, however their priority order varies.
Inference: Critical skills required for transformation to the knowledge economy compromise personal, technological and basic skills as well as behaviours, and the education on the same needs to commence in early childhood.	

SQ2: What is the precise nature of the gap between the skills, knowledge and behaviours of both the Emirati and Expat work force and that required in the UAE knowledge economy?	
Outcome Interviews	**Outcome Questionnaire**
• UAE education system is not generating adequate number of graduates with the required skill sets, • Skills, knowledge and behaviour of Emirati graduates has improved but there is a lack of understanding regarding the cultural preferences and motivation, • Emirati prefer public sector work due to its attractiveness, • Required critical technological, personal and basic skills are largely missing in the UAE.	• Critical skills required in a Knowledge Economy are largely missing

Inference:
UAE is importing critical skills from overseas and that a deeper understanding of Emirati culture is required to increase their contribution to the knowledge economy. Therefore further research regarding the same is recommended.

SQ3: What challenges & opportunities exist to enabling education to contribute effectively to UAE's transition to a knowledge economy?	
Outcome Interviews	**Outcome Questionnaire**
• Business Leaders have a limited understanding of the Education System in the UAE and its initiatives, • Business Leaders deem the current accomplishments of UAE based schools and tertiary education facilities to meet labour demand for the Knowledge Economy as low, • Business Leaders stress the importance of alignment between the Economic Vision, labour market needs and the curricula both at school and tertiary level, • The need for merit-based admission to university and a stringent assessment methodology for personal and academic development was highlighted, • UAE has not established a research-based culture and hence continues to fail to register intellectual property rights, • Vocational studies in the UAE are altogether unknown to Business Leaders, • Teacher quality, their development and the absence of Emirati teachers as role models was identified as a key gap.	• Business Leaders are unclear to what degree the UAE Education system generates graduates with the requisite skill set, • Critical success factors for school and higher education establishments to support the knowledge economy are not in place.

Inference:
Educationalists need to gain a deeper understanding of the challenges and opportunities at hand and their role in resolving them. This needs to occur in interaction with Business Leaders to ensure alignment with labour market needs.

SQ4: What is the involvement of Business Leaders in influencing UAE Government and universities to ensure that curriculum design and outcomes meet future labour market needs	
Outcome Interviews	**Outcome Questionnaire**
• Strategic Partnerships between UAE Government, Education Sector and Business Leaders is minimal, • Business Leaders identified the opportunity of entering a dialogue but have limited investment appetite and are focusing mainly on graduate recruitment • Imported Education models need to be adapted to local cultural norms and have to reflect the requirements of UAE's vision of a Knowledge Economy	• 'Business Leaders have not formed diverse types of strategic partnerships with the UAE government and Educationalists
Inference: UAE Government has the opportunity to create platforms between Business Leaders, Educationalist and the Government itself to enable close collaboration and alignment between all stakeholders	

SQ1: Which skills, knowledge and behaviours are required in UAE's transition to, and continuing development of, a knowledge-based economy?

The quantitative survey conducted in 2019, hypothesis H1, was based on previous research regarding skills set for the knowledge economy (Schoning & Witcomb 2017; BC 2018) and since four of the six skills are proven the hypothesis was accepted. Cognitive flexibility and Emotional Intelligence were not ranked highly in previous studies but identified by respondents as critical. Therefore, whilst there is alignment of all three surveys in terms of the skills included, their priority order varies, which may reflect different industry sector preferences and when the research snapshot was conducted as the skills needed change over time (Schoning & Witcomb 2017). The 2015 skills need ranked in the Future job report (Schoning & Witcomb 2017) differs considerable from the 2020 ranking.

In the earliest qualitative interviews conducted, no formal ranking was given, and competences was the preferred terminology. Basic skills in core subjects such as mathematics and science, technical skills, innovation and entrepreneurship, strategic thinking, decision making were emphasised, and personal skills, including emotional intelligence, stress management, relationship management and flexibility. The second interviews in 2018 produced a set of skills that were rated by the participants: Technological skills and personal skills were mentioned as critical on an equal basis

while basic skills were mentioned to a lesser degree but still identified as a critical foundation in the Knowledge Economy, tables 15 & 19.

The minor difference between the skills sets mentioned in the qualitative and quantitative data collection may be connected to the inclusion of all management levels, and those without management responsibility in the quantitative study, who are very likely to require a different set of skills, based on their team responsibilities, for instance collaboration with others which requires emotional intelligence and active listening are very important at an operational level.

An interesting outcome from this research shows that stress management would be important for all and particularly for Emiratis as they are accepted to manage huge roles and leadership at an early age according to the ongoing Emiratization. As a leader at this age you will not have developed the parallel thinking (Jaques 1986) and you will need a reliable team to support you. In this process trust is important (Ali 1996) which has proven to be difficult with expatriates staying for short periods of times.

This is of importance for the role of education in the UAE as this needs to be instilled and fostered in early childhood. As the participants confirm in this research: skills are easier to fix than behaviour when a person is an adult. This is because the foundation is set in early childhood and therefore this research shows the importance of good early childhood education. Also work ethic and motivation are issues which needs to be added to the role of education. As discussed in the literature review and in the research part life-long learning is of importance in a knowledge economy. To foster lifelong learning a challenge needs to be perceived as learning opportunity rather than a humiliating failure, according to Dweck, Walton and Cohen (2014), and also related to being able to remain engaged with learning over the long term, by finding strategies to enable continued motivation to learn. This learning will not be fostered by using classroom behaviour management systems with awards and punishments (Lipnevish et al. 2016). With these classroom systems the student "needs not to have any motivation in a behaviour but to the reception of an award or the avoidance of a punishment" and it is considered the least self-determined form of motivation Lipnevich et al. (2016, p. 254).

Therefore, the answer to the research question is that that skills required for transformation to the knowledge economy not only consist of technological skill but include equally important personal and basic skills as well as behaviours. The educational strategy needs to focus much more on early childhood education, as identified in both sets of interviews, business leaders recognising that attitudes and behaviours such as lifelong learning and creativity are developed at a very young age and tend to change little as the individual grows.

SQ2: What is the precise nature of the gap between the skills, knowledge and behaviours of the Emirati and Expatriates workforce and that required in the UAE knowledge economy?

Little progress appears to have been made in terms of the general perception of shortage of skills required by the labour market, or of the lack of capacity for the present educational model to deliver them in sufficient quantity. In some perspectives, the skills of Emiratis had improved, but this viewpoint depended on the job sector involved, suggesting that some progress had been made to change the Emirati mindset regarding work preferences. However, an additional barrier to accomplishing a greater private sector contribution to the knowledge economy by Emiratis was stated as being the continued reliance on importation of overseas workers.

Whist cultural conflict was a major theme in both sets of interviews, the HR personnel in the first interviews focused far more on this aspect of the workplace than on developing key knowledge economy skills than in the later conversations. However, the first interviews revealed that cultural conflicts were present amongst all nationalities. This was also acknowledged in the second interviews where it emerged that employing expatriate graduates also had a high cost risk owing to short contracts; their short term focus on working in UAE private sector and their preference for entrepreneurship, which is in line with a so called gig economy. By the second set of interviews, more remarks were made that implied that employers needed to gain a greater understanding of local values regarding work ethic and motivators in line with Dixon and Dogan (2004).

The first interviews held between 2014 and 2016, suggested that the skills shortages in UAE labour market were related to technological, personal as well as basic skills: new technologies and associated with lack of positive attitudes to acquiring them; mathematics and science skills; strategic thinking; entrepreneurship; ability to multitask; flexibility in relation to conforming to workplace norms; social, emotional and cultural awareness understanding particularly related to the multicultural environment; work ethic; competitive attitude; resilience.

In 2019, responses were similar however ICT skills and those related to data analytics and AI, incapacity to generate intellectual property rights relating to innovation were stressed. Furthermore a range of soft skills including teamwork, and behaviours such as positive work attitude, commitment to lifelong learning, and openness to private job sector opportunities in relation to Emiratis as they have a strong preference for public sector work due to higher salary and benefits, lower working hours, and cultural environment.

The interview participants were not restricted by any ranking of named skills, whereas the survey respondents were forced to choose from a list of potential skills. However, the quantitative findings converge and reinforce the qualitative findings, which increases the validity of the study, because cognitive flexibility, critical thinking and complex problem solving complement the examples given by interviewees: cognitive flexibility relating to multitasking flexibility and strategic thinking for instance; creative thinking is required for entrepreneurship, acquisition and application of mathematical and scientific principles, and solving cultural conflict problems; complex problem solving is necessary for strategic thinking, effective employment of data analytics and AI and leadership capability.

In the quantitative study, the skills gaps were identified on the basis of skills missing from the UAE labour market; the greatest skills shortages were cognitive flexibility, critical thinking, complex problem solving and emotional intelligence. These findings of skills shortages align more closely with Schoning and Witcomb (2017) representing four of the top 10 forecast for 2020, complex problem solving at position 1 and critical thinking in position 2 in that hierarchy.

Consequently, the answer to the research question is that critical skills across technological, personal and basic skills are missing and that the UAE education

system is not generating adequate supply of knowledge workers. Both the qualitative and quantitative data supports this finding. Furthermore, a more in depth understanding of the Emirati culture is required to increase participation in the private sector.

SQ3: What opportunities and challenges exist to enabling education to contribute effectively to UAE's transition to a knowledge economy?

In both sets of the interview the business leaders' opinion of UAE educational model had not improved over the period of the research, in relation either to the suitability of the curriculum to deliver required skills or the teaching quality. Furthermore the interviews suggested that Business Leaders have a limited understanding of the UAE Education Systems and its reform. Hypothesis H3 of the quantitative survey in contrast did not provide a clear answer to what degree the UAE Education system generates graduates with the required skillsets.

Teachers were perceived as delivering content without making any connection to the knowledge economy and remained focused on theoretical rather than practical application. All students were encouraged to attend university, irrespective of their ability in key subjects and no career guidance was given to support appropriate career decisions. Recruitment of university students should also become a selective process based on appropriate levels of skills in the major subjects not merely a case of passing the school diploma. Furthermore, the outcome of H4 strongly suggested that Business Leader believed that the critical success factors for school and higher education establishments to support the knowledge economy are not in place.

A major barrier to enabling education to contribute effectively to UAE's transition to a knowledge economy is the current educational mindset, which has evolved from adopting western models without prior testing or adaptation. The lack of skilled private and public-school teachers or education to generate enquiry-based learning and apply new individualised student learning pedagogies required for developing knowledge workers is also a significant barrier to accomplishing educational, social and economic goals.

In western countries the education models made from and for the culture in which it is being used are being criticized (Cuban 2014). So even though here is a need for these models (Shami et al., 2016) still they should be further adapted to the local context. As looked at in the literature review for example individualism (Hofstede 2010) is very high in the USA and Western countries like the UK, from where the education models are imported. These models are not showing the students that teamwork is of importance, which also will be found in its hidden curricula and current assessments.

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Furthermore, a challenge can be the power distance norm (Hofstede 2019) as the knowledge economy with creativity and innovation and cooperation would be, as discussed in the literature review, well led with a failure friendly approach.

The UAE had made virtually no progress regarding an innovation or a research culture from the first to the second interview period, and continued to fail to register intellectual property rights, which were to its detriment in terms of its global ambition as a knowledge economy. Universities continued to lack a research culture (Peters 2003) and any joint research or teaching innovation with industry, the only contact between the two groups was underpinned by the business leaders' motivation to identify and recruit rare talent.

Government sponsorship of local universities that have converted to a research culture is an opportunity to raise the UAEs reputation as a realistic knowledge economy competitor, whilst also developing incentives for university staff in all universities to publish research papers locally when the research was conducted in UAE. An associated opportunity would be to create a dedicated official research group comprising educationalists, business leaders and government officials to generate signals of change of focus.

The tertiary sector should move from the current theoretical to a research-based culture, particularly the local universities, since these tend to maintain the Emirati mindset for the superiority of public sector careers. This change in culture was specified as necessary by interviewees, and the present lack of research focus also indicated by hypothesis H3 as well as the lack of staff in the private sectors' lack of interest in participating in research regarding the UAE's future knowledge economy. In order to compete with other economies, this must involve industry partnerships to help generate research projects that will drive the knowledge economy goals, and be bound by universities being compelled to publish the findings, and to register the associate intellectual property rights in the UAE, rather than overseas.

A visible Government commitment to developing vocational and technical education, with two strategic objectives, firstly to emphasise the importance of high level of skills in key technologies and/or industries, and secondly to raise its profile from a second-rate career opportunity to a vital knowledge economy requirement. The credibility of such an initiative and its economic value could be best achieved by the

Government sponsoring vocational placement in private firms, in which technical and soft skills are developed, and trainees have the opportunity to follow programmes that lead to accredited qualifications and/or technically based degrees with theory units integrated.

This initiative would reduce the issue of labour market skills shortages, encourage more companies to undertake training and development of school leavers and new graduates. Whilst such a programme would be focused on Emiratis, the study has demonstrated that expatriate young people living in UAE are also vital for achieving knowledge economy goals, since there are insufficient Emiratis in the population given the size of the economy.

In terms of local culture, there is a very strong need for UAE education policies to integrate local values and traditions. The Literature Review demonstrated that Arabic parents believe that insufficient media educational resources are available in Arabic (Salem 2017). Whilst Emiratis also require good English skills, it is likely that the educational resources in English predominate. The lack of Emirati male teachers is an issue, furthermore encouraging Emirati business leaders to be involved in the classroom teaching/environment would help to change mindsets about teaching and private sector business. An associated part of cultural aspects of UAE education should be developing cultural awareness between Emiratis and children of expatriates from a variety of nations, so that mutual understanding of cultural norms develops in the context of what connects cultures, as suggested by the business psychologist.

Career guidance has been mentioned as vital on several occasions, and the implication was that the education curriculum should include the subject at all school and university levels, in contrast to the current situation in which a few firms select specific universities to recruit talent, rather than adopt any integrated activity with the sector.

Therefore, integration of practical application and industry involvement in careers education, is required, which spans understanding of how the private sector operates, how its goals are linked to the UAE economic, social and political targets, which impact directly on the student's future. In other words, strategically focused career education in a practical rather than a theoretical concept, for instance including activities mentioned by interviewees, such as guest lectures in the school and

university contexts. The school industry link could take a variety of forms; demonstrating the practical application in industry of STEM subjects, providing an insight into how new technologies operate and what benefits they have socially and economically, short work placements for school and university students.

Teacher development, which includes gaining deep insight into the knowledge economy goals and their importance to the UAE economically, politically and socially, and involvement in designing curriculum and pedagogy to deliver it. This should be developed in conjunction with education and industry leaders. Teachers could also spend time in private firms observing or partaking in the application of the skills they will teach and similarly industrialist working in schools and universities to demonstrate practical industrial applications of simple concepts.

Educationalists at all levels, practitioners not merely non-teaching strategists, need to be provided with a range of opportunities to gain deeper understanding of the issues and their role in resolving them. This requires financial and time investment by educational practitioners and business leaders, which does not provide either group with achievement of their short-term goals, profit for companies and student achievement data for schools and universities. However, these are being achieved at a cost of inadequate student development and continuing shortage of key skills in the labour market.

SQ4: What is the involvement of Business Leaders in influencing UAE Government and universities to ensure that curriculum design and outcomes meet future labour market needs

Comments made in both sets of interviews suggested that very limited partnerships between Businesses Leaders, the UAE Government and Educationalist have been established and that the focus of Business Leaders lays mostly on graduate recruitment with some associated skills building interventions.

Additionally, strategic partnerships involving joint research projects or exploiting the skills of private sector experts to teach at universities, or to advise on the curriculum or practical applications were very limited at best. Hypothesis H5 confirmed the limited partnerships mentioned in the interviews and highlighted the willingness of Business Leaders to engage in a discussion to ensure that the right skills are being developed at school and higher education level. Hypothesis H5 also demonstrated the limited opportunity for business and education collaboration which, when it existed, seemed to have been initiated by individual companies mainly on the basis of recruiting talent for a profit motive, rather than strategic intention of supporting the UAE economic, social and political goals. The interview comments confirmed the hypothesis findings.

An additional barrier is the lack of mechanism for schools and universities to collaborate with business leaders, to gain an understanding of the current skills gaps expressed in this research, and their implications for the UAE's future economic and social health.

Government and educationalists also have the opportunity of gaining more insight into a variety of different education models, with which business leaders are personally familiar, or have knowledge of by means of market intelligence and the skills and abilities possessed by expatriate employees, for instance Indian education generates high levels of mathematical competence. Dialogue between industry and education to explore and discuss these models, would be an opportunity to shape new educational policies in a way that would enhance PISA outcomes and subsequent UAE higher education and innovation performance. In both sets of interviews, the Singapore model was cited, since industry leaders worked with government to ensure

that the education policy met labour market needs in terms of skills and changing attitudes towards traditional preferred job roles.

A major opportunity for education to contribute effectively to the UAE knowledge economy goals is for Government to create platforms to enable close collaboration between education and businesses, in order to build mutual understanding.

Therefore, the answer to the overall research question can be stated. The question is:

What is the perspective of UAE business leaders regarding the role of regarding the role of education in generating the skill set required by the labour market to ensure the UAE's transition to a knowledge-based economy?

Business leaders generally believe that education has a significant role in preparing young people with the requisite skills for the labour market needs of a knowledge economy. This should be leveraged as the literature highlights that the majority of Business leaders in the states believe they are self-made (Molnar 2014) and therefore do not consider education crucial for their success. However, in the UAE business leaders want to collaborate regarding the role of education and can identify themselves as being part of a wider solution (Playfoot & Hall 2009).

According to them the primary role of Education is to develop a constant flow of talent with the right skills sets, behaviours and knowledge and to continuously enhance the same in order to stay competitive in a global context. Business Leaders identified as critical foundation a joint effort between Government, Business Leaders and Educationalist is required to establish an ecosystem consisting of schools, universities and vocational studies in alignment with private sector requirements.

However, the current model is not successful in doing so, and several individuals stated that a model similar to the one based on the principles adopted by Singapore was needed. In this model the government had involved business leaders in discussions regarding labour market needs to deliver the knowledge economy goal, and instituted career guidance to alter the traditional job roles favoured by Singaporeans.

Furthermore, basing the education model on competition in line with the three sociological traditions (Collins 1940) as discussed in the literature review. The system was rigorously tested, and inspection methods altered to reflect skills levels rather than merely attainment. Therefore, the business leaders suggested that the UAE government should institute platforms for collaborative discussion and educational policy making between educationalists and business leaders, which enabled their diverse major goals to be integrated. More focus on early childhood development and facilities to be provided for Emiratis and on integrating elements of the local culture into educational models from the earliest possible age. However, this thesis also demonstrated that business leaders, particularly HR personnel also needed considerably greater understanding of local culture and motivators to attract Emiratis to a private sector career and to retain them in the long term.

Finally as a summary, the research show that the importance of early childhood education, which the closest published work listed in Table 10 overlooked. Furthermore, the socialisation process as one aspect of education, with issues of motivation that is not in line with the lifelong learning characteristic and value of a knowledge economy. The pressure of the young UAE nationals who become leaders at a very young age is another interesting finding in this research and has been further discussed above, also in comparison to Jaques (1986) parallel thinking concept.

5.4 Recommendations

The main recommendations from this thesis include the following points which will be discussed in further detail:

- Establishment of a platform involving the UAE government, Business Leaders and Educationalists,

- Increase attractiveness of public sector work for Emiratis and provide opportunities to Expats to contribute to the transition in the long run,

- Revisit of Education model incorporating the views of all stakeholders and resulting in a customized Education Model for the UAE,

- Extend educational framework inclusive of early childhood education and research-based universities as well as vocational studies,

- Improve teacher quality and install an inspection methodology covering personal and academic development,

- Career education and cross-cultural awareness need to become an integral part of school and university education.

The major recommendation from this thesis is that a platform be created for direct links between government, educationalists and business leaders to leverage the opportunities and, therefore, the probability of UAE accomplishing a knowledge economy by 2021, or as soon as possible after that date. This suggestion aligns with the WB (2018) concept of how a knowledge economy should be structured. It implies that research and innovation will be a major focus and delivered by close collaboration and joint research between tertiary education and business. This concept of the knowledge economy is, therefore, more focused on the infrastructure and Shami et al. (2016) highlights a platform of knowledge production where you manage, create, process and share. Shami et al. (2016) continues that millennium challenges are balancing between national and transnational needs with globalization theories and deterritorialization that pushes away to a "no-place" rather than "place" but that we still need to take into account the local needs and public demands. The importance of a platform is evident in their research adding the importance of think tanks, highlighting the need for professional schools that bridge the gap between

theory and practice in line with this research and finally the interesting suggestion of 'NGOization' of knowledge and impact in the development and humanitarian industries. Furthermore, this is in line with Mohamed & Morris (2019, p.16) instead of "the singular framing of schools as sources of human capital".

Hence, adding, to the platform, according to the gig economy, contact details to Emirati or people based in the UAE who freelance and are entrepreneurs. This could solve short term stay of expatriates and the entrepreneurial spirit wish of the Emiratis instead of private companies hiring people who do not have the same motivation as when it's your own company selling knowledge or services or even research. According to Dweck (2005), who has conducted years of research in effort-based mind-set, this is of importance. Several new additional joint government and industry initiatives should complement this to delivering the knowledge economy goals, by means of developing a labour market characterised by high skills sets associated with knowledge economy success (Schoning & Witcomb 2017).

The educational model should be revisited and compared with successful educational models that have been identified by initiatives such as PISA (OECD 2017) but, rather than adopting an unaltered established model, the perspectives of educationalists, Emirati academic and industrial leaders, and teachers who are to develop and implement it should be gathered and their view incorporated into a customised new initiative. Still the impact of the NSM in the Emirate of Abu Dhabi did not show in the latest PISA (2018) study that was published in December this year, 2019. As the grade 3 rollout was in 2010 and all P-12 grades were included in the NSM in 2016 (ADEC 2010) it means that these students were 16 years old by the time of the last PISA study conducted. Still this NSM only apply to the Emirate of Abu Dhabi and its government schools and not the rest of the 6 Emirates nor private schools.

This aligns with a multiple perspective taken to decision making suggested by Dixon and Dougan (2004); the hermeneutics approach being most applicable. The policy approach of Haddad (1999) of combination of rational bureaucratic mode combined with a social, political mode that enables change as required by external environmental change is also a suitable approach, that recognises the interests of academics and government and the reality of a changing economic and political environment.

The educational framework should be extended at both ends, early childhood education to be incorporated as a vital educational development stage, with a professional devised curriculum delivered by early years specialist teachers and subject to inspection as are other stages of public and private education (UNESCO 2014: Heckman & Masterov 2007; Harvard Centre on the developing child 2019; Copenhagen consensus centre 2014).

At the tertiary level universities must become research institutions that can compete globally and still meet national and public needs and be characterised by the quality of innovation that they generate by close collaboration with industry, generating high technology start-ups and registering intellectual property rights supporting lifelong learning and sustainability (Peters 2003ab; Brown 2015; Brinkley 2008; WB 2018; OECD 2005; Bell 1974; Mardi, Almsafir and Yao 2011). Vocational education must become a respected alternative that develops highly skilled individuals and tacit and implicit knowledge (Sami et al. 2014), competent with new and developing technologies (Levy and Murnane 2013), as well as the soft skills required to ensure high levels of collaboration and networks of contacts (OECD 1996). This should be achieved by companies being provided with incentives to organise additional in house or joint training initiatives with others.

Teacher quality should be improved and their status in society raised, as has happened in Finland (Sahlberg 2011) and Singapore where teachers earn salaries on a par with industry, are highly qualified and involved in teacher development activities, for instance (UNHDI 2014; UN 2019; OECD 2017a). Close ties between headteachers, the Minister of Education and major business leaders enable two way dialogue and mutual interaction about progress in schools, and capacity to discuss opportunities and challenges that help to develop policy as the environment changes (Fullan 2001; Huberman 1994 as cited in Hargreaves 2010; Economist 2018). As with all other stages, robust inspection methodology shaped by the views of the educational strategy body based on appropriate practices learnt from other successful educational systems, should be implemented and regularly and at the earliest possible stage, evaluated for their continuing effectiveness in order to act on challenges (OECD 2017a; Economist 2018; Moffet 2000).

The research showed that careers education and cross-cultural awareness need to become an integrated part of school and university education but approached from a more holistic viewpoint than traditional models (Dixon and Dogan 2004; Al Ateeqi 2009; Dedoussis 2004; Schwartz 2007). The interviewees were concerned about the lack of career guidance and poor knowledge of alternative job opportunities, such that a range of practical initiatives, for instance business leaders or their representatives partaking in classroom activities, and teachers and students gaining work experience would provide mutual understanding of the other perspective. Interviewees expressed the different agendas and priorities of business and education that needed to be better understood.

In terms of culture, the theories demonstrate the key differences in national and organisational culture between UAE and expatriate groups (Smith 2001; Nonaka 1994) but also the similarities in some cultural dimensions (Hofstede 2018; Hampden-Turner & Trompenaars 2012) so that focus on what connects different cultures, rather than aspects that divide them, offers one approach to positively develop students' cross cultural awareness and to minimise work conflict.

5.5 Implications of this Research

- Skill set need to reflect the characteristics of the local economy and its current transition stage into a Knowledge Economy,

- Extension of educational models is required to enabling education to contribute effectively to UAE's transition to a knowledge economy which encompasses developing expatriate labour within those permanently living in the country,

- Integrated approach between Business and Educational Leaders to deliver the required skill sets,

- Workplace practices need to align to with the culture of the UAE,

- Career guidance early on focusing on personal and academic development, particularly for Emiratis, is instrumental.

The skills set for the knowledge economy depend on the country and its unique situation and stage of development, previous research appears to be merely a guide, and this research has shown the subjective nature of the group of skills required, by the diverse responses from different industry sectors. It has also demonstrated and confirmed the constantly changing nature of knowledge economy skills sets.

Substantial implications have been generated from the findings of this thesis regarding the nature and delivery of UAE education at all levels, with considerable extension of the framework, and of teaching methodology in schools and in universities. The inferences relate not only to the current educational curriculum and its delivery but to the major gaps in content and context that have emerged, and that are vital to UAE achieving its economic goals. Hence, theoretical educational models need to be extended and the situation in UAE is likely to extend to other Gulf countries with the same economic issues derived from previous dependence on oil, use of expatriate workers and adoption of the western educational models.

In the educational perspective the biggest implication is a complete overhaul of the educational system its implementation, to incorporate suitable theories related to policy making (Dixon & Dougan 2004), to determine a model that is appropriate to UAE (Bellanca and Brandt 2010; Cuban 2013; Reigeluth and Karnopp 2013) that

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encompasses the need to develop the necessary skills of Emirati and expatriate young people living in the country (Rugh 2007). This is necessary since expatriate labour continues to be required as there are too few UAE nationals to generate the forecast GDP output. However, the study found that importing overseas labour was a barrier to achieving economic goals, and the UAE goal is to reduce reliance on imported expatriate labour, a proportion of which has low skills that will be obsolescent (Al Hammadi & Mohiuddin 2018). Therefore. developing expatriate labour within those permanently living in the country is an associated implication of this study and the education model will need to incorporate the associated cultural elements rather than adopt a universal model designed for a different context.

Therefore, the major practical implication is finding the means to ensure that business leaders and UAE Government are able to recognise the strategic value of an integrated approach to delivering the skills sets they jointly require but for different purposes. Practical implications of the study also include the need for substantially more investment in time and money by both UAE government and Business leaders, in order to jointly benefit from the opportunities that this thesis has revealed. As both parties are already focused on individual goals, the substantial additional burden will need to be managed and motivated by the end goal of mutual advantage.

An implication for companies is that their approach to cultural differences regarding work practices and lifestyle need to be amended to align with the culture of the UAE. The interviews strongly demonstrated that HR personnel, and to a lesser extent other business leader, have expected to implement work practices that were developed overseas (Hofstede 2018). This approach has created considerable conflict with employees, who come from a range of different cultures (De Vries 2012). The remarks made implied that HR personnel require much higher levels of cross cultural skill, insight and emotional intelligence to fully develop the potential of skilled Emiratis and to retain them, especially as it was evident from other responses from business leaders, that developing expatriates was high risk owing to their intention to remain in the country on a short term basis only.

Still the research show that Emiratis experienced a great deal of pressure owing to the expectation that they would be the future business leaders of the UAE's transformation to the knowledge economy (Duncan 2018), furthermore not always

receiving the needed support from their expatriate mentors. As discussed in the literature review and specifically according to Jaques (1986) 25 years of working experience is need in order to have parallel thinking or wisdom, as expressed by Ackoff (1989), know-how knowledge by Fricke (2009) and expertise as is needed in a knowledge economy.

Those individuals, who possess knowledge are able to accomplish greater effectiveness because they can identify patterns, investigate the reasons for them and accomplish better decisions (Boddy, Boonstra and Kennedy 2008). Therefore, it will be difficult to take on roles and responsibility without having reached this level mentioned and the researcher recommends looking into this further.

5.6 Limitations

- Complexity of concepts spanning economic, social and political theories and relating them to the UAE as an economy in transition,

- Identifying best in practice examples for education systems enabling transition to a Knowledge Economy and their suitability to UAE context,

- UAE government perspective due to not full access to educational polices, reports et cetera,

- Availability of Business Leaders to discuss topic at hand and their potential anchoring bias relating to Western Education Models.

The complexity of the concepts that underpin this thesis was a huge challenge, specifically economic, social and political theories related to the idea of a knowledge economy, for which there is no agreed model because each country tends to adopt it in a different way so that it is driven by its human and physical resources and its key competences. This is complicated in the UAE because it is a newly emerging economy that was initially dependent on its natural oil and gas reserves but within fifty years of revolutionary change in its economic wealth and social fabric, it must adopt completely new strategies and approaches to build a sustainable future, owing to the substantial changes in the global environment and the decline in demand for its fossil fuel reserves. Its education system has also been subject to radical change

within 15 years without any real means of testing its suitability to accomplish the goal of Emiratis gaining the skills and knowledge to steer it.

In the educational sense, it was challenging to find existing education systems globally that were associated with exemplary progress towards a knowledge economy, the main benchmark were PISA statistics, which are based on academic attainment scores rather than application of knowledge or skills. These reports are purely theoretical, and since countries such as Finland are acclaimed as models in one era but lose their position and are replaced by traditional educational regimes, for instance Singapore, there is no proven model. Business leaders also judge the UAE educational outcomes against these exemplars, which also influence their perspective of what can be achieved.

Therefore, the study scope also needed to focus on the principles of the education system in relation to the labour market needs of employers in a range of sectors, which were highly dependent on importing skilled workers and had little previous direct knowledge of Emirati work culture and motivators. Hence, building the conceptual framework and sequencing it in a coherent order was difficult and, whilst international academic studies on knowledge economy, educational policies and pedagogies were relatively easy to access, gaining deep insight into UAE Government mindset, policies and reports was challenging. Hence, a major limitation is that the researcher may not have captured the UAE Government perspective fully, nor the agenda behind the educational policies and practices that were designed in conjunction with western educational experts. Whilst Government documents reports cannot be easily accessed other than by official reports, for instance PISA tests and WEF reports comparing UAE progress with other countries that aspire to a knowledge economy were used.

Most private business leaders are also expatriates, whose experience of education influences the estimation of what the UAE has accomplished so far. Business leaders were also difficult to access, because their priority is making profit and not participate in research, which shows the lack of a research culture. Although improving skills in the labour market is important to them, and many found time to attend interviews, often these were rushed as was found in the first set of interviews in which many questions were not fully answered and could not be used such that a second set of

interviews were required. Distributing a questionnaire was another obstacle because of the acknowledged resistance of the UAE business population to completing and returning them. Therefore, the theoretical sample size was reduced considerably but the participant profile indicated that it was representative, and the high return rate added to its validity.

A limitation of the semi-structured interviews, as discussed in the methodology part, is that it cannot be generalized, still according toFlvyverg (2006, p.222) "predictive theory, universals, and scientism, the study of human affairs is, thus, at an eternal beginning. In essence, we have only specific cases and context-dependent knowledge. Predictive theories and universals cannot be found in the study of human affairs. Concrete, context-dependent knowledge is, therefore, more valuable than the vain search for predictive theories and universals". This is in line with the research as it is needed to put the role of education and the needed skill set in the UAE context.

According to Merriam (2009, p. 5) quantitative research and in this case the inquiry of survey describes 'what is'; "how variables are distributed across a population or phenomenon" with frequency or findings of a representative selection as aim has a limited option of in depth answers. Therefore Bryman (2004) argues that quantitative and qualitative research can investigate the same issue using different approaches hence, mixed methods are used in this research. Finally, Merriam (2009, p. 8) states that in qualitative research there is "almost no consistency across writers in the look on philosophical foundations", whereas in quantitative research there is less risk of bias (Winter 2007) therefore mixed methods attempted to avoid the limitations of the data collection used.

Furthermore, it needs to be noted that the idea of this thesis was started in 2012 and it was supposed to be submitted by 2016 however due to a sudden family emergency issue the study was put on hold. Still this made the study longitudinal which is of great interest in order to see the development of UAE's transition to a knowledge economy.

5.7 Scope for Further Study

- Understanding of local culture and work preferences in order to better integrate Emiratis into the private sector,

- Requirements to establish a UAE based research hub representing a key enabler of a knowledge economy,

- Linking schools teaching with private sector skill, knowledge and behaviour requirements in order to create alignment between the two,

- Early childhood education proving the foundation for skills, knowledge and behaviours required in a Knowledge Economy.

Several ideas for further study have emerged from this research, for instance assessing the degree to which in depth knowledge of the local values and work ethic could support employers to create the environment that would motivate Emiratis to work in the public sector. Most private sector employers are not Emirati, and several participants indicated that better understanding of Emirati motivations towards a career would help to encourage them to join the private sector and to remain employed in it. The first set of interviews suggested the HR personnel perceived the cultural mix a large challenge rather, than adopting the suggestion of an Emirati participant who proposed that looking for what connects individuals of different nationalities, rather than focusing on the differences, would be a more effective strategy.

The issue of the university teaching culture is another recommendation for study, in respect to what initiatives could be adopted to successfully change universities into research hubs involving full industry participation with the objective of significantly increasing the UAEs global rating for research, and eliminating the activity of overseas academic staff publishing research conducted in the UAE outside of the country. The joint industry and university research culture would also foster closer links and understanding of the required labour market skills and the limitations that academics currently have in providing them.

A third suggestion is the development of strong industry school links, which would involve the researcher gaining insight into STEM teaching methodology in a range of public and private schools, assessing the feasibility of teachers spending some time

working in local industry, and employees teaching in schools to provide a practical perspective on what is being learnt on a theoretical basis. Ideally the feasibility of Emirati males working in the private sector and participating in these links with public schools could also close the role model gap of teachers in the public sector, whilst exposing students to Emiratis with a preference for the private sector. This would actually constitute two studies.

Lastly early childhood education is an additional knowledge economy theme, for which research could be undertaken, primarily with Emirati children in the preschool context, to learn more about the cultural attitudes and behaviours that motivate them and appropriate interventions that would assist their educational and skill development whilst nurturing their local values. Of course, this type of research is also relevant to the primary and secondary level, as has been indicated by several participants in this research. Following the PISA 2018 result which were published in December 2019 further research should be conducted regarding the NSM in the Emirate of Abu Dhabi and whether it should be widened to further schools. The PISA results did not show any progress still, as discussed earlier in the literature review, the results should be analysed with caution.

5.8 Concluding Note

The UAE are facing the complex task of building a nation, establishing an oil-based economy and transforming it to a Knowledge Based Economy within less than fifty years. The amount and speed of change that the UAE and its society has witnessed and will continue to see in their endeavour is unprecedented. The founding father of the UAE, Sheikh Zayed bin Sultan Al Nahyan, highlighted the importance of human assets and their education and provided a crucial wisdom for the following generations: "The real asset of any advanced nation is its people, especially the educated ones, and the prosperity and success of the people are measured by the standard of their education."

This thesis has provided substantial evidence that business leaders consider education as a means for developing the skill set required to accomplish the UAE's ambition to be a leading knowledge economy.

Business leaders realise that education must accomplish a variety of social, economic and political objectives and while their prime objective is to make profit, nevertheless there is a joint objective to increase economic output, by means of knowledge-based industries to create competitive advantage. Business leaders are responsible to their companies for generating innovation that ensure their sustainability and yet currently operate in a vacuum from the talented students at local and international universities, who need to learn how to apply their knowledge to generate new products and services to support expansion of knowledge industries.

This research has demonstrated that business leaders have a great contribution to add to ensuring the UAE transform to a knowledge economy quickly, but this can happen only if the UAE Government and Education Leaders acknowledge their value. Business leaders are skilled in gathering market intelligence and this includes appraising other education systems, as is evident from their comments on education in Singapore and Finland; they also have the technology to gather and interpret large quantities of data. As senior executives in multinational companies, they are able to access a range of useful data to support appraisal of global education systems and their outcomes as well as use parallel thinking (Jaques 1986).

However, their feedback suggests that the current education policies and practices operating in all stages of the UAE education systems are not providing the labour market with sufficient individuals possessing the required skills.

This conclusion is reinforced by previous studies that the UAE's progress to the knowledge economy is slow, for example Warner and Burton (2017, p.19) commenting that "well-paced jog than a sprint" and by the last published PISA assessment the lack of progress in developing a culture for innovation demonstrated by the continuing low output of research papers and patents and the slight decline in the number of new medium and high tech companies (Hameed et al. 2016).

In addition, the UAE objective of generating more highly skilled Emiratis to participate in the private sector at senior management level has not made enough progress, although the research shows that the skill-set of some Emiratis have improved.

The first of the major outcomes from this thesis, regarding the role of education is that the vital early childhood education is being neglected, and little is known about the learning pedagogy and objectives in the private sector. The school system remains too theoretical, with teachers failing to connect the content they are teaching with the objectives of UAE's vision, and therefore students acquire no rationale for what they learn and are not acquiring the practical and soft skills required in a knowledge economy. At tertiary level, this thesis has demonstrated the lack of Business Leaders engagement to research and vocational education.

Secondly a vital output from this thesis is the mismatch between skill-set required for the knowledge economy espoused by western research papers, and those that UAE business leaders consider as appropriate to drive UAE competitiveness. The inference is that education reforms are based on delivery of skills that will not optimise output and that little attention is given to promoting lifelong learning. Instead, award and punishment classroom management systems are being used, which is the least self-determent form of motivation. Furthermore, Business Leaders stress the importance of basic and personal skills as well as behaviours beyond the technological skills required in a Knowledge Economy. The research shows as well that in order for the UAE to become a knowledge economy, innovation and creativity are of importance however according to Brown (1994) where there is no trust there is no vulnerability

and there will be no innovation and without a failure friendly environment there will be no creativity. This is in line with this research that highlights the importance of emotional intelligence. Business Leaders think that it is easier to learn new skills in adulthood than changing a behaviour or attitude of employees. The foundation for Behaviour and attitudes is set in early childhood and therefore Early Childhood Education is of importance. Furthermore, the imported education models are from individualistically focused countries and these models can be argued not to fit in a knowledge economy where teamwork is of importance nor in the UAE with its collective cultural norm context where trust is of importance for knowledge transfer to take place. The socialisation process as a part of the role of education is lost in the hidden curricula and might cause confusion for the UAE nationals' identity. However, there is a shift from the typical GEI lender and borrower nations to a partnership where the UAE is not a passive recipient but in the financial position to choose the education model suitable, negotiate terms regarding needs and be involved in the whole process of the various stages. Therefore the specific UAE national focus and perspective is of relevance to the transition to a knowledge economy and still further research is recommended in this complex situation involving various human chains. There is a lot of pressure on the leaders in the country as they are given great responsibility at a young age without the needed support of the mentors of whom the majority stay and support the transition for solely two years without sufficient involvement. Hence, further involving the expats in the transition was a suggested solution. Also in the context of multi-cultural differences in the transition period, the main Emirati strategy was to focus on our similarities as everybody being human beings.

Thirdly this thesis stresses the necessity for Business Leaders and Education Leaders to gain a deeper understanding of the Emirati culture in order to increase their involvement in the private sector. For the Government the key questions at hand are how to address the Emiratis preference for public sector careers despite efforts taken to change this and furthermore how to attract and retain Expatriate talent which is and continuously will be required in the Knowledge Economy.

Fourthly, there is no knowledge platform for Business Leaders to manage, create, process and share (Shami et al. 2016) its insights with Government or education professionals. In order for a knowledge economy to thrive there needs to be cooperation between the triple helix in a country (Peters 2003). However, this research highlights the importance of a platform that includes additional partners beyond the Government, Business Leaders and Educational Leaders such as researchers, policymakers and practitioners to share knowledge and practice, so that the output of skills levels from the education sector could be substantially enhanced.

Therefore, the concluding remark for this thesis is the possibility that it will prove useful to UAE Government bodies and education institutions as a catalyst for change in the way decisions are made regarding educational policies and practice in the country. Finally, the research has proven that business leaders can make a significant contribution to accelerating the acquisition of the skills needed to accomplish a knowledge economy and are willing to do so.

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APPENDICES

Appendix 1: Pre and Post validated Interview documents

Question	Final	1st Pilot
1. Please provide an overview of your organisation and your role within it	Final	1st Pilot
2. How would you define the knowledge economy	Final	1st Pilot
3. (a)What are the major skills that businesses require to transform the UAE to a knowledge economy	Final	1st Pilot
3. (b) To what extent are these skills available in the labour market currently	Final	1st Pilot
3. (c) What improvements have you detected in the skills of Emiratis in the labour market	Final	1st Pilot
4. The UAE Government's education policy fundamentally aims to prepare Emiratis for full participation in the labour market (a) In your opinion what are the essential aspects of a public education system that could generate the desired skills and knowledge that Emirati young people require	Final	1st Pilot
4. The UAE Government's education policy fundamentally aims to prepare Emiratis for full participation in the labour market (b) To what extent do you perceive that these outcomes are being accomplished	Final	1st Pilot
5. How well does the UAE tertiary education system support the local labour market needs, for example a. Universities b. Research c. Vocational and Technical Education	Final	1st Pilot
6. (a) Please describe partnerships you have developed with the tertiary education sector?	Final	1st Pilot
6. (b) What have been the opportunities and challenges?	Final	1st Pilot
7. (a) In your experience, what is the level of skills and knowledge of Industry 4.0 technologies amongst young Emiratis entering the labour market, for instance, Artificial Intelligence, Internet of Things and Big Data?	Final	1st Pilot
7. (b) How does this differ from those of young expatriates entering the labour market?	Final	1st Pilot
7. (c) If there is a difference, what are the reasons?	Final	1st Pilot
8. What has been your role in helping the UAE Government to shape (a) School educational policy and teaching methods? (b) University educational policy and teaching methods? (c) Vocational and educational policy and teaching methods?	Final	1st Pilot

9. (a) What further contributions could businesses make to the current UAE education system to ensure there are sufficient future employees with the required skills, knowledge and attitudes for the private company workplace (b) what practical interventions would you employ for this purpose	Final	1st Pilot
10. (a) What do you consider the reasons that motivate or deter companies from employing young Emiratis?	Final	1st Pilot
10. (b) How, if at all, do these differ from the reasons that motivate or deter companies from employing young expatriates?	Final	1st Pilot
11. (a) What do you consider to be the most important learning and development interventions that you provide for you employees?	Final	1st Pilot
11. (b) Why are these so critical?	Final	1st Pilot
12. Are the imported education models suitable to the UAE context? Are any changes required?	Final	-
13. From your point of view, are there any differences in views on the role of education and skillset needed between business and educational leaders in the country?	Final	-
14. What is the role of education in UAE's transition to a knowledge economy and in the knowledge economy in your opinion?	Final	-

Appendix 2: Sample transcription of interview

Question 1: Please provide an overview of your organisation and your role within it.

Managing Director of Education consultancy in the UAE which helps Sovereign Wealth Funds to build capacity, knowledge, skills and attitude of Emirati graduates entering the labour force of the aforementioned Sovereign Wealth Funds.

Question 2: How would you define the knowledge economy?

Knowledge economy is an economy which is dependent on brains i.e. intellectual capital and not on traditional production means **(KE)**

Question 3:

(a) What are the major skills that businesses require to transform the UAE to a knowledge economy?

The key skills for business themselves are to recruit the right kind of employees which will enable them to transform their business and to be competitive in the knowledge economy. Consequently, businesses first need to be clear what kind of skills are required in their industry in the transition to and the knowledge economy itself. Furthermore, as technological change is so rapid and the UAE is not a leading knowledge economy yet, employees need to have the skill to absorb technological knowledge, requirements and change in order to make it useful for their company.

The most important skill for employees is the right attitude and strong knowledge in the basic skills of writing, reading, mathematics and comprehension **(KE1***). If these fundamental skills are mastered, then other skills can be learned* **(KE1)**

 (b) To what extent are these skills available in the labour market currently?

In the case of Expats not all skills are available in the UAE **(KE2)** *but where needed expats get hired from abroad to fill potential gaps in the skillsets.* **(KE2)**

Among the Emiratis these skills are not widely available **(KE2; C1a)** *however Emiratis with a strong academic background are being granted with international scholarships where they refine and broaden their skillsets.*

(c) What improvements have you detected in the skills of Emiratis in the labour market?

Verbal and written English language proficient have improved significantly. Furthermore, does the younger generation show a greater propensity to utilize technological devices. Most importantly I have witnessed a clear improvement over the last two years of the attitude of the Emirati students towards studies and work. Otherwise no notable improvement in other skills over the last 20 year observed.

Question 4:

The UAE Government's education policy fundamentally aims to prepare Emiratis for full participation in the labour market.

(a)   In your opinion what are the essential aspects of   public education system that could generate the desired skills and knowledge that Emirati young people require?

The education system needs to drive performance by establishing clear standards which need to be met in order to advance to the next academic level **(EP1)***starting right from primary levels* (EP2a)*. If all students are finally allowed to University (education inflation) then the required filtering is not effectively in place hence the depth of knowledge and skills are not consistent.* **(EP2b3b)**

Another issue is that the primary education does not prepare students for university adequately. . **(EP2,2b)** *The necessary foundations are not being set for them to succeed in an academic environment (***EP2,2b***). The academic models are not delivering the required knowledge, skills and behaviour(***EP2b, 3b***) And colleges have evolved into being academic rather than being practical* **(EP3,3b).**

Furthermore, the education system needs to be clear what end results it wants to achieve and or support **(EP1).** *In the case of Singapore there was a clear focus on engineering and technology top-down form the government translated into the national curricula. (***EP1,2,3***).*

*Additionally, form my point of view mathematics are a key competency in the knowledge economy and need to be strengthen among Emiratis (*EP2a,KE1,C1a*)*

Ultimately not all students have the capabilities and inclination to work in knowledge economy related jobs **(EP3a)** *which is perfectly fine as even a knowledge economy has divers job requirements* **(EP3a).** *For these students the public education system needs to give strong alternatives to Universities.***(EP2a3a)**

(b)   To what extent do you perceive that these outcomes are being accomplished?

*The current system drives Emiratis more to government jobs and not necessarily to compete in private sector jobs (**EP3**) and there seems to be a potential disconnect between the education system and the economic vision* (**EP3**). *Furthermore reading, writing, comprehension and mathematic skills are inconsistent* (**EP2,2b**)

Question 5: How well does the UAE tertiary education system support the local labour market needs, for example:

(a)   Universities – *limited* (**EP3b**)

(b)   Research – *limited* (**EP3b**)

(c)   Vocational and Technical Education? – *limited*(**EP3b**)

Question 6:

(a)   Please describe partnerships you have developed with the tertiary education sector?

*None (**SP1**) as the training we delivered were for achieving international accreditations such as CFA. The same learning same was provided in-house* (**SP1**).

(b)   What have been the opportunities and challenges?

The opportunities are great as demonstrated in Singapore (**SP2**) *where the is a clear connection of the education system linked to the economic direction.*

Question 7:

(a)   In your experience, what is the level of skills and knowledge of Industry 4.0 technologies amongst young Emiratis entering the labour market, for instance, Artificial Intelligence, Internet of Things and Big Data?
Basic conceptual idea but no detailed understanding(**C1**)

(b)   How does this differ from those of young expatriates entering the labour market?
Expatriates are more competent in this field. (**C1b**)

(c)   If there is a difference, what are the reasons?
        Exposure to the topic they had during education(**C1c**)

Question 8: What has been your role in helping the UAE Government to shape

(a) School educational policy and teaching methods? – *none* **(SP4)**

(b) University educational policy and teaching methods? – *none* **(SP4)**

(c) Vocational and educational policy and teaching methods? – *none for government* **(SP4)** *but* *extensive* experience in *shaping the same for Government owned entities* **(SP12)**

Question 9:

(a) What further contributions could businesses make to the current UAE education system to ensure there are sufficient future employees with the required skills, knowledge and attitudes for the private company workplace?

All businesses are aware of what skills are required in their industry. However, business is not willing to engage and invest in relationships with universities to help develop these skills **(SP5a)**

(b) what practical interventions would you employ for this purpose

Businesses role is to *teach workplace specific* *skills which are required in the* *practical* *environment.* *skills* **(SP5b)***The* *academic organizations* *need to build the* *knowledge foundations* *which as mentioned earlier are* *not fully developed among students' skills* **(SP4b)**. *So, in a nutshell the role of both stakeholders is fundamentally different as their context is different. I don't see* *realistically how Universities should teach workplace specific skills* *as they can only be acquired in a practical environment* *skills* **(SP5b)**. *Based on my own experience* *learning accounting and applying it in a practical environment are two different skills.* **(SP5ab)**

Question 10

(a) What do you consider the reasons that motivate or deter companies from employing young Emiratis?
Lack of knowledge, skills and attitude **(C3c)** *as well as* *unrealistic expectations among students at the beginning of the career* **(C3c)**

(b) How, if at all, do these differ from the reasons that motivate or deter companies from employing young expatriates?
No answer given

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Question 11

(a)   What do you consider to be the most important learning and development interventions that you provide for you employees?

Promotion of self-development of the employees and offering life-long learning opportunities across various topics. **(KE3)**

(b)   Why are these so critical?

*Employability of the individual in the long run as the skills need to be up-to-date and broadened over time***(KE3)**. *Acquiring a degree as a student and not further developing the skills are not possible in today's economy and even less in the knowledge economy.* **(KE3)**

ADDITIONAL INFORMATION

1. Are the imported education models suitable to the UAE context? Are any changes required?

Many elements of the models are relevant as the local economy is competing globally. However, for the local students the models need to get adapted to their local culture which is fundamental different than from some Western cultures. **(RE1)**

2. From your point of view, are there any differences in views on the role of education and skillset needed between business and educational leaders in the country?

Educational leaders focus on the process of educating as a primary focus in term of knowledge

Business leaders are looking for the skillsets and the attitude ultimately. The practical experience is required to transit from an academic to a practical environment. Business Leaders cannot expect that universities will teach the practical skills required in business. Such expectations are unrealistic, and universities need to teach the foundation and the business will mould the foundation into what is required.(RE2)

(a)   What is the role of education in UAE's transition to a knowledge economy and in the knowledge economy in your opinion?

The majority of future economic growth will be driven by intangible assets which includes the human capital. Ultimately the knowledge economy in the UAE will not be created by the educational sector but the requirements of the Business sector. **(RE3)** *The role of Business is to leverage and to develop the assets of human capital once it leaves the university. The university needs to provide student with the basic skills of mathematics, writing, reading, comprehension and attitude in order to give them the opportunity to work and to develop have the staff to develop.*

Please add any further comments you think will be helpful to gaining deeper insight into how business leaders in the UAE could support the Government's goal of transforming to a world class knowledge economy.

THANK YOU FOR YOUR TIME AND CONTRIBUTION TO THIS RESEARCH

Appendix 3: Sample completed quantitative questionnaire

Questionnaire Survey UAE Knowledge Economy

Thank you for participating in my research, which has the purpose of identifying the role of education and the skills and attributes required for accomplishing a knowledge economy in UAE. The main theme of the study, a doctorate thesis, is to gain insight into the impact of educational reforms occurring in UAE on development of these skills and attributes, from the perspective of business leaders and other business professionals. In other words, your views on the extent to which labour market conditions are changing as a result of new educational policies and practices.

Your opinions are vital to gaining a deep understanding of the opportunities and challenges represented by the knowledge economy, and the contribution that Emirati employees can make to your business performance and to the UAE economy. There are no correct or incorrect responses, and your comments will remain confidential, such that any feedback that is included in the thesis will not be traceable to any individual. Once the thesis is complete all records of this survey will be destroyed.

The questionnaire should take no longer than 20 minutes. You can withdraw from this research at any time.

I have read the confidentiality statement and am happy to take part in this survey

Yes ☒   No ☐

Thank you.

Section 1: Background Details

These questions allow the researcher to create a profile of the participants in the survey and to indicate that a wide range of opinions have been gathered

Questions 2-8 Please put a X in the appropriate box (ONE box only)

2. Are you Male ☒   Female ☐

3. To which age group do you belong?

18-25 ☐   26-35 ☐   36-45 ☒   46 -55 ☐ over 55 ☐

4. Which is your native country

UAE ☐   Non-UAE ☒

5. Please indicate your highest qualification

Doctorate ☐   Master's degree ☒   bachelor's degree ☐

Professional Qualification ☐   Secondary School education ☐

6. How long have you worked for your current employer

Less than 1 year ☐   Less than 5 years ☐ 6-10 years ☐ 11-20 years ☒

More than 20 years ☐

7. **Which industrial sector do you work in?**

Government ☐

Advertising & Marketing ☐

Entertainment & Leisure ☐

Food & Beverages ☐

Transportation & Delivery ☐

Automotive ☐

Business Support & Logistics ☐

Construction, Machinery, and Homes ☐

Insurance ☐

Manufacturing ☐

Nonprofit ☐

Retail & Consumer Durables ☐

Telecommunications/ Technology ☒

Utilities, Energy, and Extraction ☐

Unemployed ☐

Healthcare ☐

Real Estate ☐

Airlines & Aerospace ☐

Education ☐

Financial Services ☐

Other ☐   Please specify: ……………………………………

8. What is your job role?

Senior Manager ☒   Middle Manager ☐   Manager ☐   Non-Managerial Role ☐

Other ☐   Please specify: ……………………………………

9. In which specialist area are your main responsibilities?

Innovation ☐   Information Technology ☒   New Technologies ☐   Strategy ☐

Finance ☐   Human Resources ☐

Other ☐ Please specify: ……………………………………

SECTION TWO: MAIN QUESTIONNAIRE

Question 10 provides a range of definitions of the knowledge economy. Please place a tick in the ONE box that describes most accurately what you understand knowledge economy to mean.

A change from industrial to post industrial economy, based on innovation rather than invention ☐

An economy based on interrelationships between human beings instead of between human and machine, as in the past ☐

I have no idea

Theoretical knowledge as the core economic resource and associated with creating new products and industries ☐

An economy in which technical and professional skills are required, and demand for low skills has declined ☐

Knowledge is the source of productivity and growth in a knowledge economy, with focus on information, technology and learning ☐

Knowledge economy is characterised by education and training to generate skilled professionals, a dynamic digital infrastructure, economic incentives and a network of universities, research establishments, private companies and communities, ☒

Other: ☐   Please provide your own definition …………………………..

Question 11 The soft skills required for a knowledge economy are suggested in the table below, please choose the skills you feel are most important to accomplishing the knowledge economy in order of preference 1-13, with 1 being the most important and 13 least important

	Skills	Preference 1-13
A	Critical thinking	1
B	Cognitive flexibility	3
C	Emotional intelligence	4
D	Complex problem solving	2
E	Judgement & decision making	5
F	Creativity	6
G	Active listening	11
H	People management	9
I	Service orientation	7
J	Coordinating with others	10
K	Negotiation	8
L	Quality control	12
M	Other please state what this is	

12 Please state the reason for your number 1 choice the most vital skill

……………………………………………………………………………………………
…………………………………………………………………………………..

13 In your experience, which of these soft skills are not available in the UAE labour market, please tick ALL that apply

	Skills	Missing in UAE Labour Market (**Tick ALL that apply**)
A	Negotiation	
B	Quality control	
C	Service orientation	
D	Coordinating with others	
E	People management	
F	Creativity	
G	Active listening	
H	Judgement & decision making	
I	Emotional intelligence	
J	Critical thinking	X
K	Complex problem solving	X
L	Cognitive flexibility	
M	Other please state what this is	

Question 14: concerns the outcomes from the current UAE Educational Reforms in terms of their impact on the labour market. Please indicate the extent of your agreement or disagreement with EACH of the statements by ticking ONE box for each part of the question

	Statement	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Disagree strongly
A	The UAE educational reforms foster development of skills the labour market requires		X			
B	Teaching methodology in the school education system is appropriate for developing knowledge economy skills			X		
C	The changes in the school curriculum support future labour market needs		X			
D	The skills required by the labour market have improved as a result of educational reform, in the case of Emiratis	X				
E	School leavers and university graduates				X	

	have adequate technology skills and are able to apply them well					
F	Teaching methodology in the higher education system is appropriate for developing knowledge economy skills			X		
G	The educational reforms have ensured that more highly qualified and skilled are available in UAE labour market each year	X				
H	The skills required by the labour market have improved as a result of educational reform, in the case of young expatriates educated in UAE	X				
I	There is inadequate vocational education provision in the UAE			X		
J	The UAE local universities have developed a research culture				X	

K	University course remain too theoretical so that graduates are not ready for the workplace			X		

Question 15: Please indicate the critical success factors for school and higher educational establishments to support the knowledge economy. Please tick ALL that apply, then indicate if this factor is currently satisfactory by stating Yes (Y), No (N) or Don't Know (DK)

	Factor	Tick **ALL** that apply	**Currently this is satisfactory (Y/N/DK)**
A	Teacher quality		
B	Integration of technologies in teaching methodologies	X	Y
C	Students employ latest technologies as a learning tool	X	Y
D	Students develop work ethic and values		
E	Students develop appropriate behaviour		
F	Student centred exploratory learning		
G	Learning tasks required solutions that apply critical thinking		
H	Students collaborate to solve problems		
I	Students engage in cross curricula projects to promote connected thinking and knowledge sharing		
J	Awareness of new technologies, for instance robotics and artificial intelligence	X	N
K	Science, Technology, Engineering and Mathematics taught by enquiry led learning and research		
L	Multi language capability		
M	Advanced computer skills, for example coding, handling data, software	X	N
N	More Emirati role models in education system		

		Strongly Agree	Agree	Neither agree nor disagree	Disagree	Disagree strongly
O	Adequate resources for practical work in science and engineering subjects					
P	Emirati culture and traditions integrated into curriculum and approach to learning					
Q	Others: Please specify …………………………………………………………					

Question 16: The purpose of this question is to gain knowledge of how business leaders and business professionals have contributed to UAE educational policies and practices, and what additional contributions they could make.

(a) **Please indicate the extent of your agreement or disagreement with EACH of the statements by ticking ONE box for each part of the question**

	Statement	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Disagree strongly
A	My firm collaborated with the UAE government and educationalists in school curriculum design and planning teaching methods, to ensure that young people gained the skills required by future UAE labour market			X		
B	My company collaborated with the UAE government			X		

	and educationalists in university curriculum design and planning teaching methods to ensure that young people gained the skills required by future UAE labour market					
C	A representative of the company participates in school/higher education teaching activities in the classroom		X			
D	My company works collaboratively on research initiatives with universities				X	
E	The company advises government and providers on vocational education initiatives				X	
F	Companies are not encouraged to advise on educational policies and practices				X	
G	The company offers on the job work experience as part of the university degree programme		X			

H	My organisation is willing to make a higher contribution to ensure that the right skills are developed at school and higher education level		X		

17 **Suggestions for further contributions to achieving desired educational outcomes are made in the table below, please indicate those you currently undertake by ticking the box, and others that you would be interested in providing:**

	Learning Intervention	Company Participates Currently (tick all that apply)	Company willing to consider (tick all that apply)
A	Work experience for higher education learners	X	
B	Work experience for school level learners		
C	Teaching practical applications of subjects at school level		
D	University teaching to link theory to workplace practical need	X	
E	Careers fairs	X	
F	Grants and/or scholarships		X
G	Teaching English for business		
H	Coaching in soft skills for business		

I	Others: Please specify …………………………		

Question 18: The final questions concerns Emiratis and expatriates in the labour market because they are the main focus of the UAE knowledge economy vision.

		Strongly Agree	Agree	Neither agree nor disagree	Disagree	Disagree strongly
A	Young graduate employees exhibit a good work ethic		X			
B	Young Emiratis are equipped with the relevant skill sets to join our organisation		X			
C	The workplace is highly multinational, which generates different views regarding preferred work practices		X			
D	Emirati graduates that have trained overseas are the most preferred to my company				X	
E	Emiratis prefer public sector employment, which makes attracting Emirati talent in the private sector more competitive		X			
F	The company is willing to provide extra training to Emiratis to ensure that they fully develop their		X			

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					X	
G	Employers should embrace local cultural and religious values in order to be able to attract more Emiratis to working in the private sector				X	
H	Emirati graduates will have mentors from my company who guides them in their new workplace and role				X	

19. Please make any further comments you wish regarding the UAE's progress in attaining knowledge economy status

…………………………………………………………………………………………

…………………………………………………………………………………………

…………………………………………………………………………………………

Appendix 4: Ethics form

Research Ethics Form (Low Risk Research)
To be completed by the researcher and submitted to the Dean's nominated faculty representative

on the Research Ethics Sub-Committee

i. Applicants/Researcher's information:

Name of Researcher /student	Hanna Buchler-Eden
Contact telephone No.	0505546280
Email address	Hanna.eden@outlook.com
Date	20/02/17

ii. Summary of Proposed Research:

BRIEF OUTLINE OF PROJECT (100-250 words; this may be attached separately. You may prefer to use the abstract from the original bid):	The United Arab Emirates (UAE) is transforming from an 'oil-based' to a knowledge based economy. An education paradigm shift is taking place and among others 21-century skills are needed, which relate to skills needed in a knowledge economy. Businesses and their leaders are influencing society (Molnar, 2014) as well as possess knowledge about what kind of skills are needed in the nation's workforce. A study will be undertaken based on semi-structured interviews with business leaders and HR leaders of companies based in the UAE and within the knowledge economy areas.
MAIN ETHICAL CONSIDERATION(S) OF THE PROJECT (e.g. working with vulnerable adults; children with disabilities; photographs of participants; material that could give offence etc...):	The researcher may encounter issues regarding research diversity; the theme is complex. Some cultural questions of differences have been considered and thought through thoroughly before hand. A research challenge also include issues related to accessing participants' cultural knowledge in appropriate ways therefore semi-structured interview questions will be used. An interview situation "is laden with ethical issues and publishing interview research entails broader socio-political concerns" (Kvale et al. 2009, p.18). This is of even greater issue when interviewing elites according to Holstein (2001) as they are easily recognizable and have a great impact on society. Therefor the researcher will consider the anonymity issue and not include data which could make a participant recognizable. A letter of consent will be handed to the participant before the interview. Still, the researcher expects that any risks, discomforts, or inconveniences will be minor and believe that they are not likely to happen.
DURATION OF PROPOSED PROJECT (please provide dates as month/year):	04/2015 – 11/2018
Date you wish to start Data Collection:	10/2016 – 11/2018

I

Date for issue of consent forms:	10/2016 – 11/2018

iii. Declaration by the Researcher:

I have read the University's policies for Research and the information contained herein, to the best of my knowledge and belief, accurate.

I am satisfied that I have attempted to identify all risks related to the research that may arise in conducting this research and acknowledge my obligations as researcher and the rights of participants. I am satisfied that members of staff (including myself) working on the project have the appropriate qualifications, experience and facilities to conduct the research set out in the attached document and that I, as researcher take full responsibility for the ethical conduct of the research in accordance with subject-specific and University Research Policy (9.3 Policies and Procedures Manual), as well as any other condition laid down by the BUiD Ethics Committee. I am fully aware of the timelines and content for participant's information and consent.

Print name: HANNA BÜCHLER-EDEN

Signature: _Hanna Büchler-Eden_ Date: 21/02/2017

If the research is confirmed as not medium or high risk, it is endorsed HERE by the Faculty's Research Ethics Subcommittee member (following discussion and clarification of any issues or concerns) John McKenny *and forwarded to the Research Office to be recorded.*
JOHN MCKENNY   13/3/17

I confirm that this project fits within the University's Research Policy (9.3 Policies and Procedures Manual) and I approve the proposal on behalf of BUiD's Ethics Sub-Committee.

Name and signature of nominated Faculty Representative: _____

Signature: _____ Date: 13th March 2017

iv. If the Faculty's Research Ethics Subcommittee member or the Vice Chancellor considers the research of medium or high risk, it is forwarded to the Research Ethics Officer to follow the higher-level procedures.

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